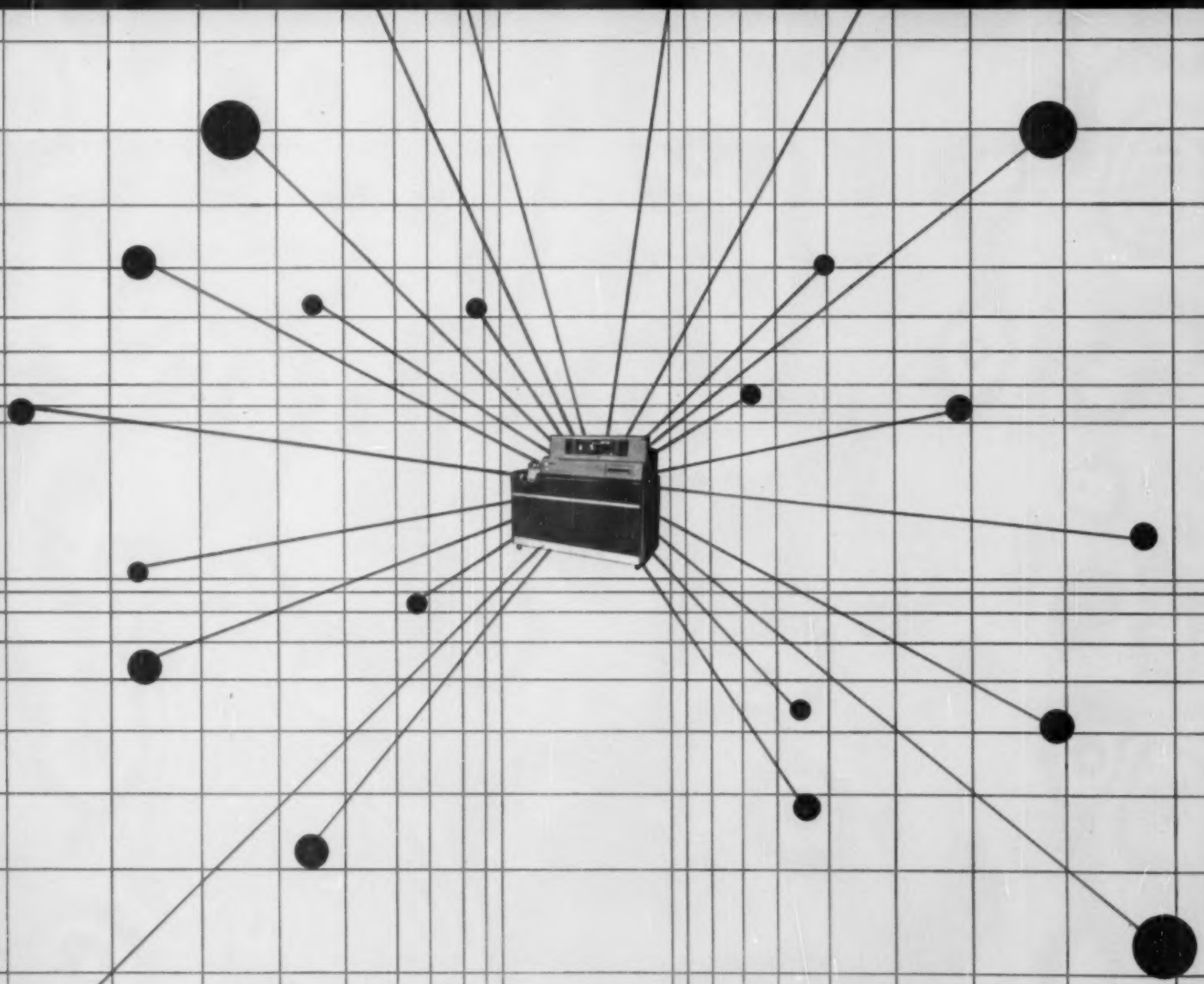
March, 1960

MANAGEMENT *and* BUSINESS AUTOMATION



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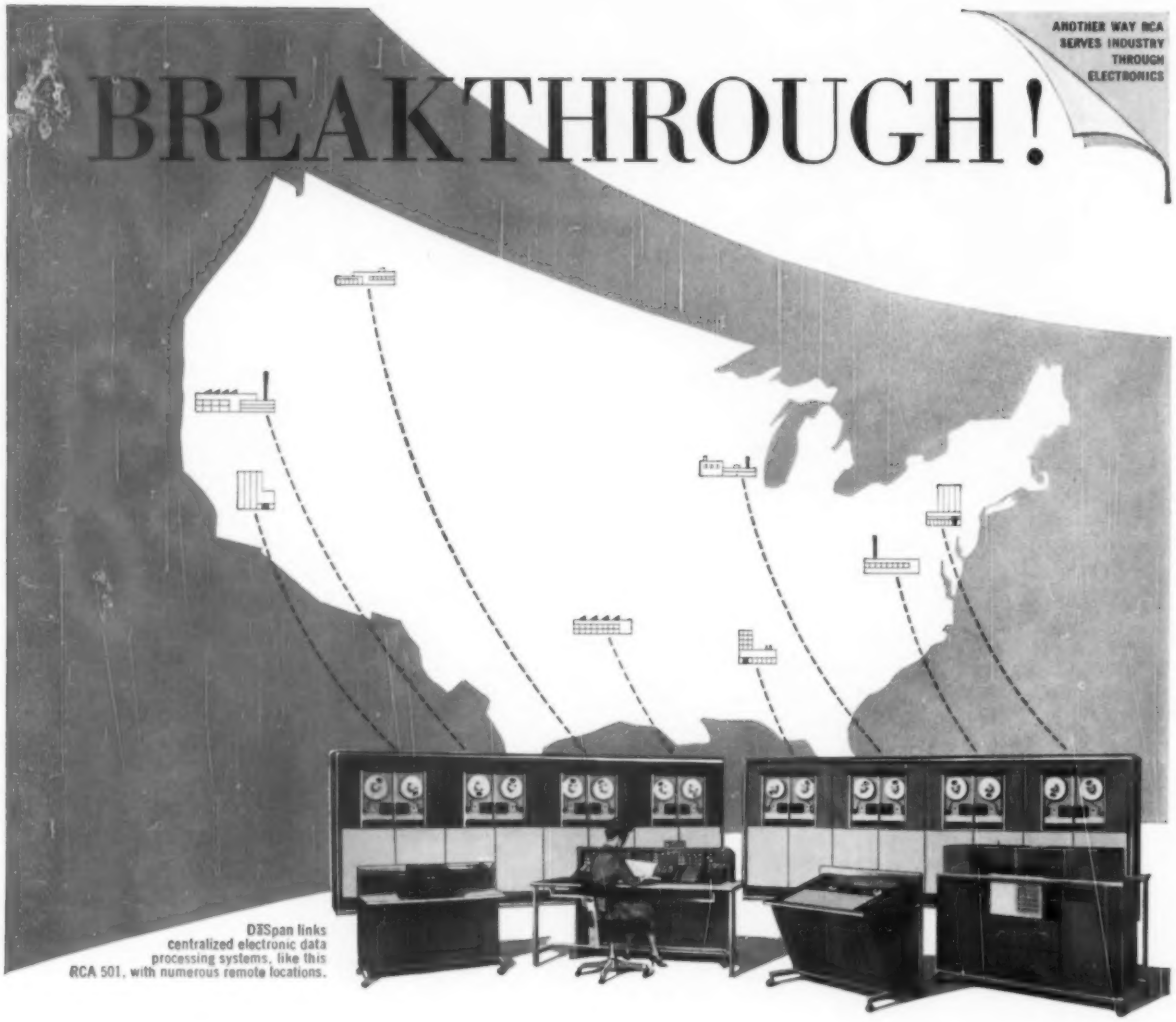

DāSpan links centralized electronic data processing systems, like this RCA 501, with numerous remote locations.

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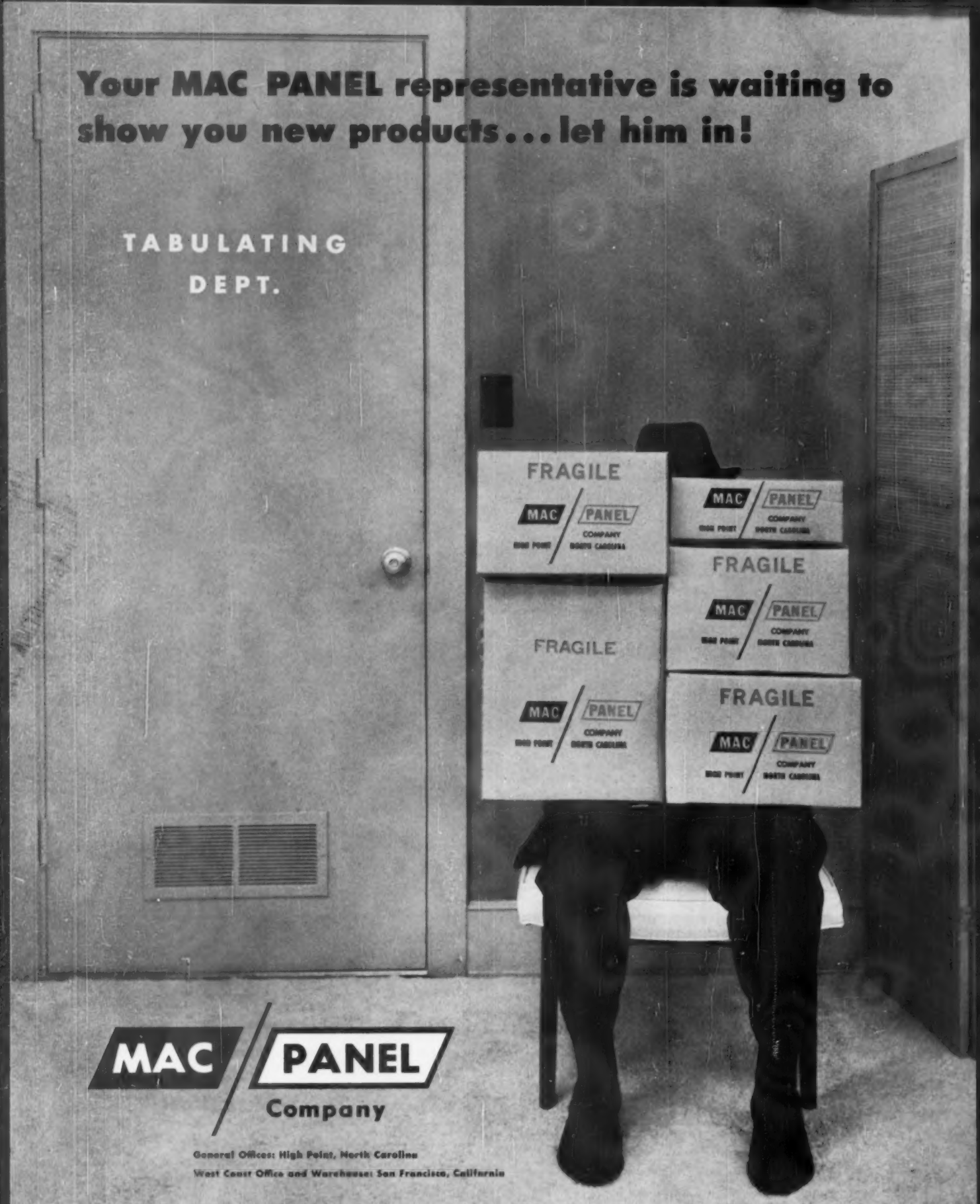

MAC PANEL Company

General Offices: High Point, North Carolina
West Coast Office and Warehouse: San Francisco, California

MANAGEMENT *and* BUSINESS AUTOMATION

March, 1960
Vol. 3, No. 3

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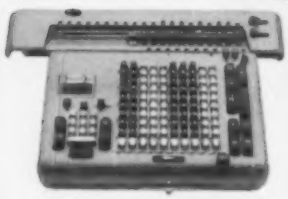
A.



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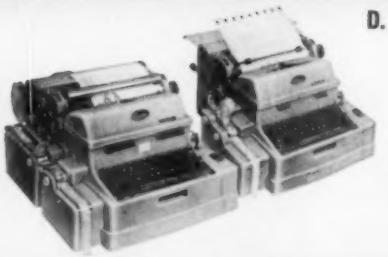

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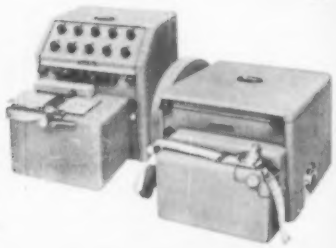

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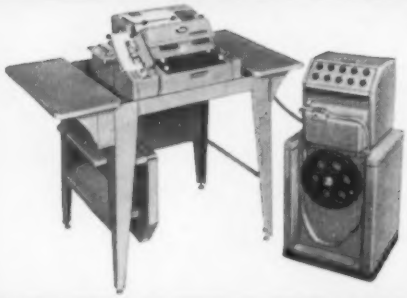

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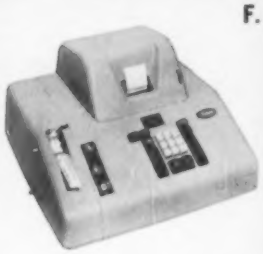

G.

MATION

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...can help you

VISIrecord Systems Specialists have the know-how to analyze your record-keeping set-up. Their experience and the facilities available to them will enable them to provide you with a time and money-saving system. Write to [illegible] for [illegible]

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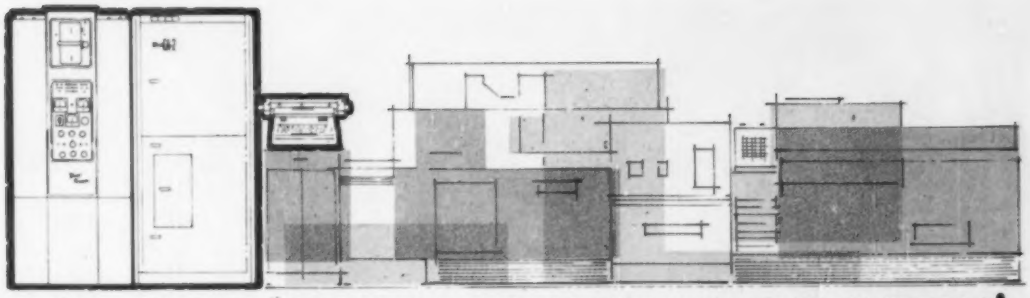
Scanning the Issue

Though slow in starting, the textile industry has made rapid and dramatic strides in the application of data processing to the many complex operations of the industry. Much of this progress is due to the cooperative efforts of the major textile firms who have formed the Textile Data Processing Association. Though fierce business competitors, they have joined to tackle the problems of greater operating efficiency — and found many of the answers. You'll find **The Textile Industry Swings to Data Processing,** page 18, interesting and informative. . . . This month's cover symbolizes textile's industry-wide approach to business automation. . . . What may well be the most important business data processing development of the new decade is reported exclusively to MBA readers in the article on **COBOL—Common Business Language for Computers,** page 22. The potential impact of this new programming technique is so great that the editors felt compelled to release the details in advance of the official announcement which is due shortly from Washington. . . . **A Filing System Solves an Input Bottleneck,** page 28, relates the frank confession of a company that "goofed" by linking their new high-speed data system to a cumbersome method of filing and selecting input. This is certainly not an uncommon mistake, and their method of solution may be helpful to many. The company, incidentally, is Craftint, whose famous Paint by Number kits have created a generation of modern Rembrandts. . . . One of the leading shampoo manufacturers reveals the savings possible by integrating label writing with [illegible] on Tuesday, page 32.



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DIVISION OF BENDIX AVIATION CORPORATION

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accelerated processing 33%...

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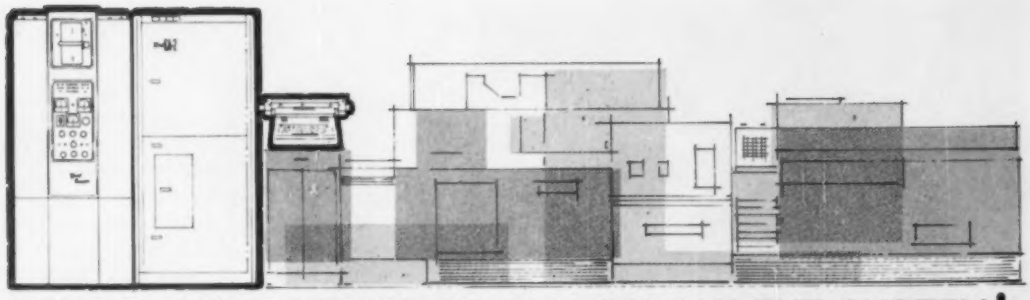

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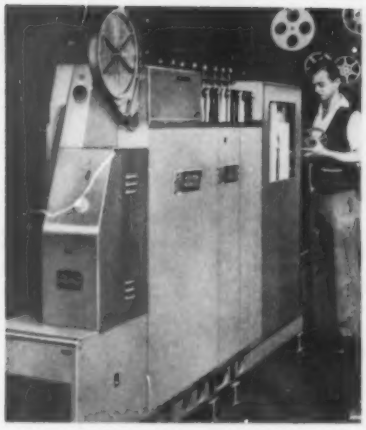

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Letters

Dear Sir:

In your December 1959 issue you have another article dealing with the "Systems Man." I am pleased that the Systems Man is finally being professionally recognized as somewhat more than a glorified forms design expert. I have noted, however, from many such articles published lately, a headlong effort to develop and entrench systems specialists having both an above average systems design ability and a thorough understanding of EDPE and other tools of the trade. Goodness knows we need them, but I am afraid too much emphasis in this direction can create a serious and costly imbalance.

By this, I mean we seem to be overlooking the "manager" who still has a strong influence on data systems design by virtue of the fact that he decides generally what the product or products of the data system will be. This will continue in spite of the fact that the "manager" is becoming more and more divorced from the data system which serves him. Now, any manager who has the inclination and courage to be honest will admit to "beefing up" his requirements for management data. I recall that when I was a manager, and before I ventured into the data systems atmosphere, I would determine my basic essential requirements for information needed to perform my job, but I would also think of and add additional elements of information as insurance against needing it and not having it. I know this to be a general practice among managers and the result is a tremendous imposition on data systems to produce information which is seldom, if ever, used.

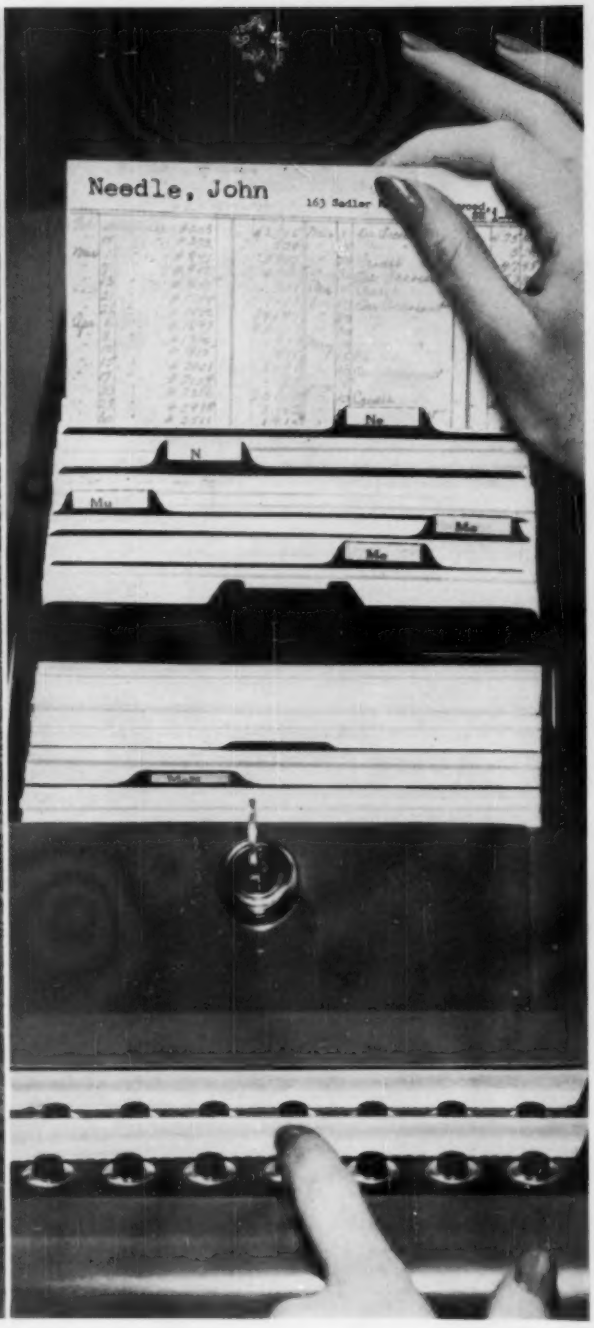
Now, the point I wish to make is this. If people at the management levels, those who decide what will come out of the data systems, were to understand generally what is involved in designing, developing, and maintaining a data system, I am certain they would attempt to confine their requirements for management information to the minimum essential elements of information. I'm not suggesting that all managers be made into systems analysts even if this were possible. But a very general orientation in what constitutes flow charting and block diagramming, programming, testing, and operating a system, as well as the cost of an average system today would, I am sure, be adequate to impress managerial personnel with the need to keep their information requirements at a tolerable minimum. How to reach all levels of management with such orientation is, of course, something of a problem in a large business and a one-time injection isn't sufficient. It is necessary to periodically or frequently repeat the message, otherwise it is soon forgotten.

One technique we have employed to advantage in the Air Materiel Command is that in the design or redesign of data systems the systems analysts work closely with the manager. In this way the analyst can inquire as to the actual need and frequency of need for information requirements expressed by the manager. This helps some, but the manager still has the final word.

I would appreciate your comments on the above "philosophy" at your convenience.

Carl C. Brooke
Assistant to the Chief
Data Systems Plans Division
Air Materiel Command
Wright-Patterson Air Force Base, Ohio

Ed. Note — The need for close cooperation between the systems analyst and the department manager is an obvious one. But, if people at the management level do not understand what is involved in designing, developing and maintaining a data system, then more than cooperation is necessary: probably new managers. (See February Editorial.) The role of the systems man is to integrate various departmental procedures into one efficient system; eliminating wasted and duplicated effort. The chief obstacle to such a program is the individual department manager who refuses to look beyond the four walls of his own operation. If orientation will overcome this, we think the systems man will be all for it.



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from the

Publisher's Desk

TERMINOLOGY in the business automation field continues to be confusing, not only to the general public but to those who are involved with it daily as well.

Recently, we saw the results of a study conducted among machine accounting supervisors, methods managers and controllers . . . a fairly articulate group. It was known in advance that virtually all of the firms questioned were involved in data processing to some degree. Yet, in answer to the question: "Do you have a data processing installation?" over 25 percent replied "No."

Apparently, the alarming number who gave a negative reply were thinking in terms of a computer installation. Their reluctance to identify advanced accounting machines, calculators, and, in some cases, punched card or tape machines as data processing equipment demonstrates the need for greater understanding of the basic terms.

Business automation is simply the substitution of mechanical, electro-mechanical or electronic methods for repetitive manual tasks. An office can be highly automated without the use of a single piece of electronic equipment. In fact, many offices were automated long before the word *Automation* was coined some 12 years ago.

Similarly, data processing is merely the handling of paperwork by some sort of a system. Automated data processing (ADP) involves the use of mechanical, electro-mechanical or electronic equipment. Integrated data processing (IDP) denotes that the system includes a common language transfer of data from one machine to another. Electronic data processing (EDP) is quite obviously based on the use of an electronic computer.

Our editors strive to use these terms in their correct context, so that they will have a specific meaning to readers. We hope that others in the field of business automation will follow suit. It's vitally important that we all speak the same language.

Charles W. Gilbert

MANAGEMENT and BUSINESS AUTOMATION

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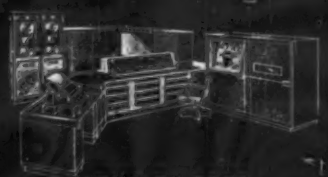

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A Statement from Francis C. Brown, Chairman of the Board and President, Schering Corporation:

"In behavioral research alone, our Burroughs computer has multiplied our productivity by 100 times!"

Dr. Francis Mechner checks computer's daily results with Ronald Ray.

"We, at Schering Corporation, have grown accustomed to miraculous developments in our industry. So many advancements have been made in pharmaceutical research in the last two decades, we are convinced that we may indeed be on the brink of a pharmacological revolution.

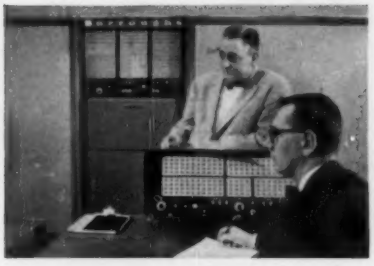
"Yet, there is so much more to be done, so many new avenues to explore, that we recognize the only real source of continued development is through expanded research efforts. Through research, Schering has already created several of the world's leading ethical drugs... major emphasis has been on cortical hormones and antahistamines. Some, like Coricidin, have become household words.

"While the results of research are sometimes dramatic, there is little of the miraculous in the day-to-day explorations made by pharmaceutical scientists. For one thing, pharmaceutical research is expensive... costs are over three times more per sales dollar than all other industries and rising substantially each year. Findings are often inconclusive and only a small portion ever reach fruition in a marketable product. And with a diversified line of products such as ours, we must maintain research projects in many different areas simultaneously. Even with the newest and most successful discovery, a competitor may enter the market with a better product that puts yesterday's 'miracle' out of favor.

"Yet, a relentless search for new products is a necessity. It is the only reasonable assurance of the continuing health of our own business enterprise. Today we are conducting extensive experimentation with chemical molecules of known pharmacological properties. The object is to achieve radically new pharmacological results by means of various alterations in chemical structure. Once achieved, these new compounds must be evaluated in laboratory animals. The methodology of this program is exemplified by an experiment carried out in Schering's Behavorial Research Laboratory. Here, eight highly trained rats take their turn in succession night and day, at a testing station where their behavior is recorded and then analyzed by computer. This is the type of experimentation in which the behavorial effects of drugs are tested in animals. The results of these experiments permit predictions concerning the effects these drugs will have on man.

"With thirteen experiments of this type proceeding on a continuous basis, the volume of data generated could never be handled without the aid of a computer. The Burroughs 205 performs computations every day which the staff

PHOTOGRAPHS BY J. ALEX LANGLEY



Dr. Bradley Whitman, Director of Research Services, confers with Gordon B. Thomas, Biometrics Manager.

of Schering's Behavorial Laboratory would require years to complete. The computer's final output is in the form of tables and graphs which are then studied and interpreted by psychopharmacologists.

"The decision to install a Burroughs 205 computer was upheld by a need to provide rapid, complete and economic analysis of the data which is produced by the research division at great cost. We investigated the computer field thoroughly, and after careful study and professional consultation, our technical people believed no other computer met our requirements so well. One of our scientific programmers, Biometrics Manager Gordon B. Thomas, was particularly impressed with the 205's ability to handle large masses of data with the power of a large scale computer... and at less than half the cost. Mr. Thomas felt the 4000-word memory of the 205 greatly facilitated the execution of research programs, many of which exceed 10,000 steps.

"In our research projects alone, the 205 has earned its keep. Dr. Bradley Whitman, head of Research Services, reports our 205 computer is turning out fast, accurate results at a cost we could never have realized by any other method. Research scientists are freed from time-consuming data collecting and may now spend more time on creative work.

"In addition to serving as a research aid, our 205 has provided us with other benefits as well.

"Our Procedures Department Manager, William B. Spencer, points out that the 205 is completely compatible with our commercial needs as well as research. In fact, our recent purchase of additional Burroughs peripheral equipment will allow us much greater capacity for commercial applications.

"As we expand and broaden our search for new products, we expect commensurate growth in other areas of our company as well, and we are confident that our 205 computer, with its modular expansion features, will keep pace with our computing needs."

FRANCIS C. BROWN
Chairman of the Board and President
Schering Corporation

Hundreds of other scientific and commercial users of Burroughs computers are confirming the same experience. Burroughs complete line of electronic data processing equipment is backed by a coast-to-coast team of computer specialists, all eager to tell you how Burroughs can help in your business. For additional information, write ElectroData Division, Pasadena, California.

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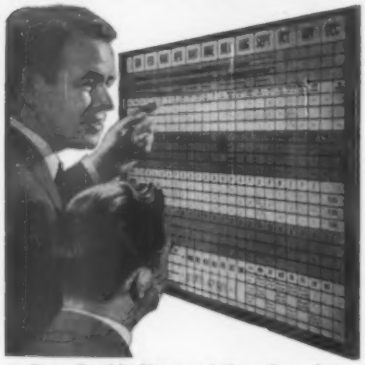

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RANDOM ACCESS

Information bits from the Editor's memory file

Computer Has a One Track Mind

A digital computer program has been designed to aid railroad management in operating two-way traffic on a single track right-of-way, according to engineers of the General Railway Signal Co. In a paper delivered before the American Institute of Electrical Engineers it was explained that the traffic pattern of up to 10 trains operating at one time on a 100 to 150 miles division can be predicted. Initial information stored in the computer describes the grades, curves, speed restrictions, signal locations and track layout. Train data includes the number, weight, and type of cars, the power of the locomotive, the origin and destination and the time of departure.

The program offers a relatively easy method to evaluate many proposed changes in either the right-of-way or the operating schedule without the expense and difficulty involved in actual field tests. New data for a complete change in track and signal layout may be prepared from blueprints in one-half day.

All Out for Inventory

For the first time in its history the Air Force is making a simultaneous, world-wide inventory of all its supplies and equipment. This involves a tally of some 1,500,000 different kinds of items at 310 bases and other installations around the globe.

The simultaneous count is possible, says Gen. White, USAF Chief of Staff, because of the availability of electronic data processing equipment and fast communications. AF property is divided for inventory and accounting purposes into 541 federal stock classes, 75 federal groups, 18 missile groups and 93 aircraft sub-classes. Previous inventories were made on one class of supplies at a time.

Fishy Report

A panel composed of fishery and data processing authorities, meeting recently at North Carolina State College, indicate that volumes of fishery statistics may be analyzed in the future through use of electronic computers.

A Tender Subject

At Texas A and M College some $3 million worth of data processing equipment is tackling a question tha' has gone unanswered since the beef industry was born: What kind of cattle, raised in what way, produce the tenderest, juiciest and best flavored beef steak.

Using a computer, the A and M scientists will eventually tie together such factors as records from birth on calves of various breeds, characteristics of their forbears (the calves, not the profs) their weight at various ages and their ability to gain weight on certain feed lots.

Chrysler Correction

Investigation of the alleged "shortnaming" of union employes by the Chrysler payroll computer (Random Access, Jan. '60) proved the computer blameless. Names involved had been shortened for old EAM procedures and were all assumed correct when the payroll was switched to the computer.

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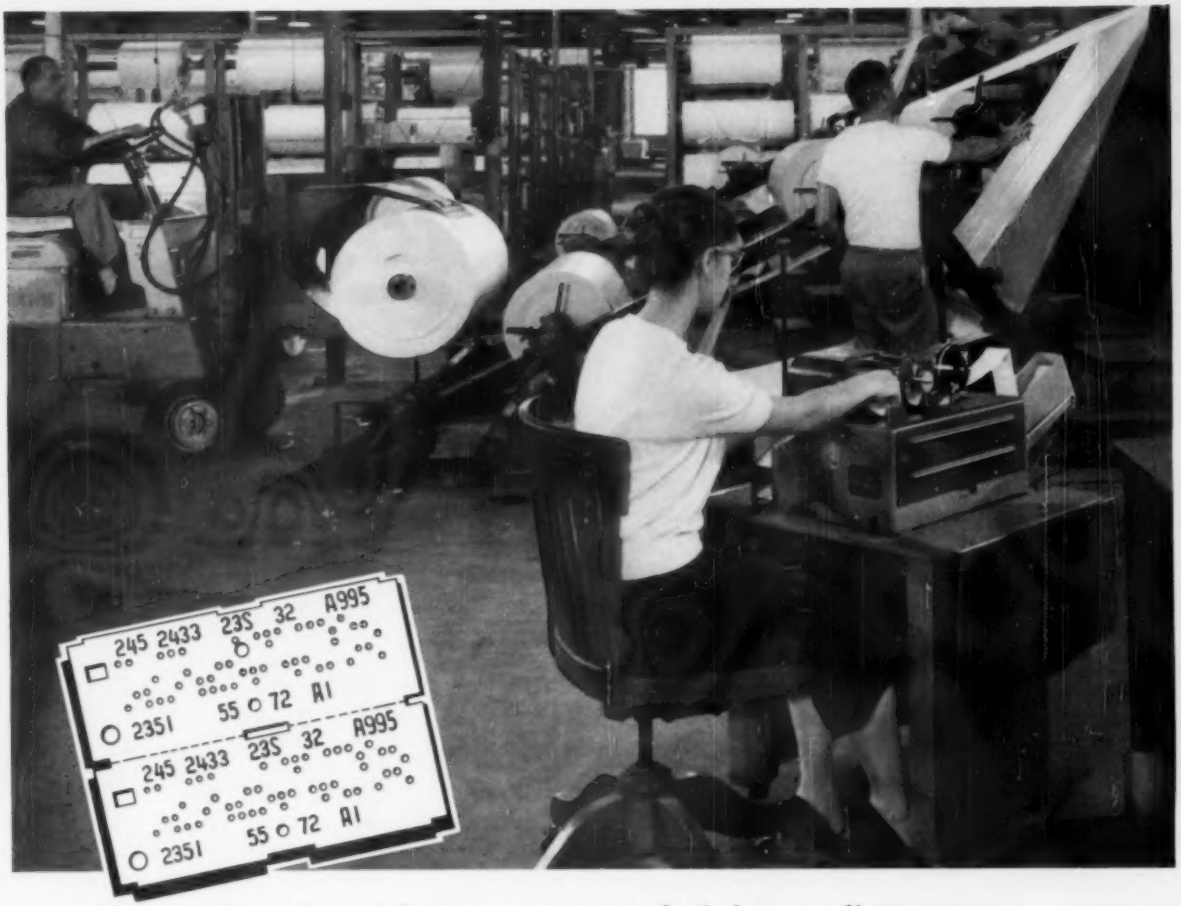

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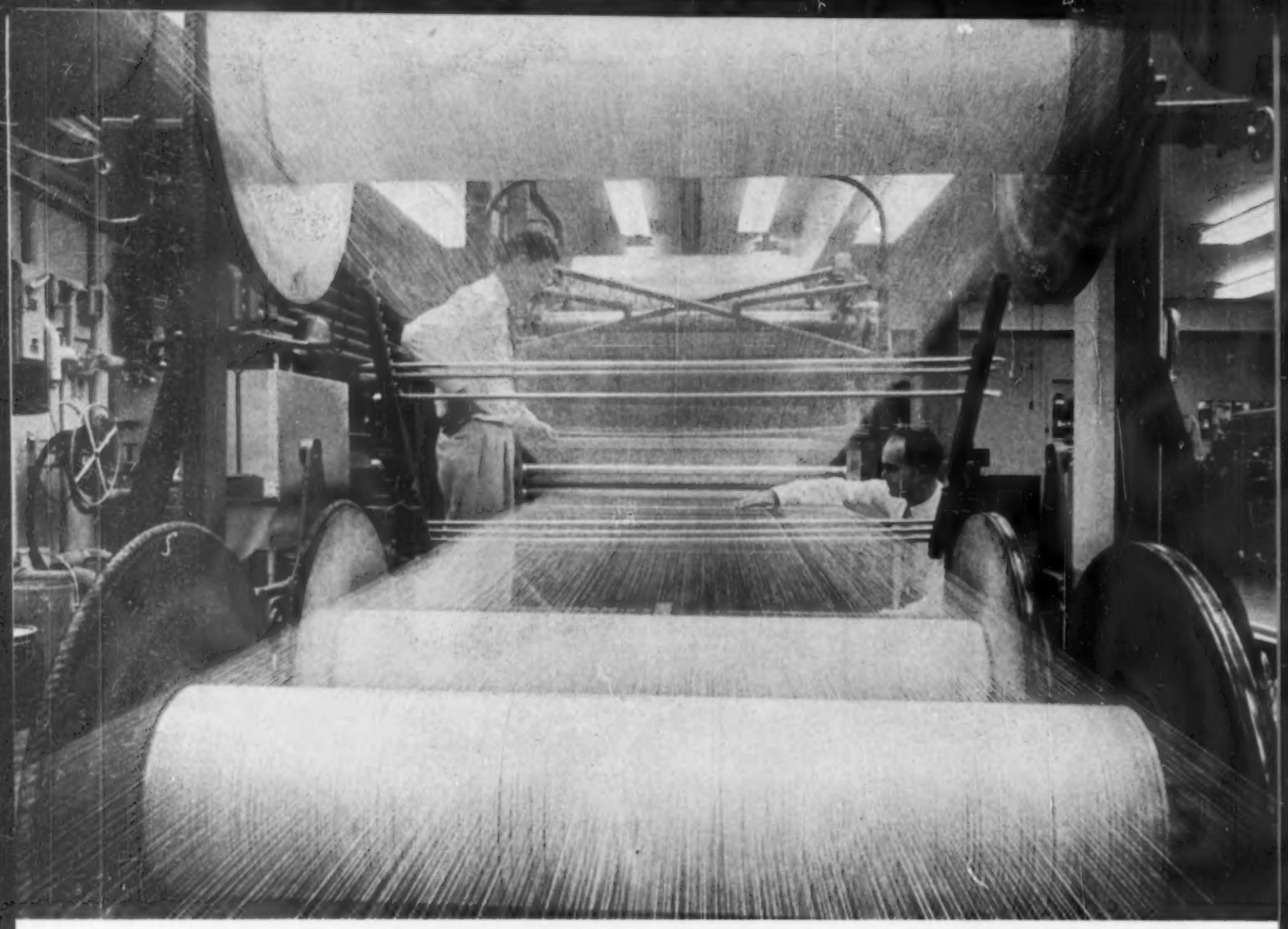

The nation's giant textile producers, long interested in the automation of production, are now cooperating in a joint effort to bring about business automation within the industry.

The Textile Industry Swings To Data Processing

SUDDENLY, the use of modern business automation techniques makes sense to the textile industry.

Data processing installations are now operating in over 600 soft goods firms, and the industry's monthly equipment rental is nearing the $2 million mark—more than triple that of six years ago. Literally every major textile firm either has an installation or a study program under way.

Textile's somewhat belated discovery of data processing potentials was speeded in part by an industry-wide alarm over sagging profits. Since 1952, earnings have risen above five percent of sales only once, and for the most part have hovered between two and four percent—a rate of return far below the eight to ten percent average of other manufacturing industries.

But actually, it was the many new equipment developments, such as low-cost punched card systems, transistorized computers, disk storage and magnetic tape, that prompted the industry's mass move to data processing. Not all of the firms, of course, are newcomers to automated procedures. Many have had punched card installations for

years. The industry as a whole, however, resisted the card approach, mainly because of the varied number of products involved for each company. To attempt punched card record keeping for thousands of items in inventory was felt to be impractical from a space standpoint, even though there may have been possible financial gains.

The advent of the computers removed the card volume barrier for the larger firms. At the same time, improvements and cost reductions in card equipment encouraged many of the smaller firms to take initial steps toward paperwork automation.

Three points in focus

In a major move to assure orderly progress during the transition, the industry formed the Textile Data Processing Association. Fifty delegates attended the first meeting, which was held in September, 1957, at the Celanese Corp. of America, in Charlotte, N. C. Since then the group has held regular semi-annual meetings, and in two years attendance has more than doubled. Forty companies are members of the association, whose present chairman is Harold E. Williams, controller of the American Thread Co.

Meetings of the group are focused on the equipment, its capabilities, and its effective uses. One point the group examined with great interest was the impact that data processing has had on managerial techniques. As Mr. Williams points out, "The electronic age of business management has not only wrought important changes in the handling of administrative tasks — it has brought about a totally different concept."

For years the business man has had to work out his decisions and do his planning on the basis of masses of accumulated data, Williams explained. "He has had to organize and summarize and refine countless facts until, finally, he arrived at what he held to be the truth, or the norm in a given situation. Now, with electronic data processing, he must learn to administer not by norm, but by variations from the norm."

Togetherness and progress

The TDPA meetings—and the willingness of its members to share their knowledge and experience in the data processing field—have been a big factor in the remarkable progress made to date. John Temple, textile industry representative for IBM's data processing division, notes that one characteristic of the upsurge is an increasing sophistication on the part of textile management in the use of EDP equipment. Originally it was sold mainly as a time-saver in various accounting operations. Now it is sold as a management tool. Stored programs and large-scale memory capabilities have introduced the era of management by exception. The industry has learned that this equipment can actually help mill executives run their business.

Installations range from IBM's Series 50 and Remington Rand's low-cost punched card equipment to Univac (Cannon Mills) and RAMAC 650 tape systems (Dan Rivers). The industry giants, like Burlington Industries, J. P. Stevens, and DuPont, have a variety of systems in operation at their various units.

The Chatam Mfg. Co., in Elkin, N. C., installed an IBM 305 Ramac last July, and is using it to maintain inventory records at the raw stock level, in process levels, and in finished goods. The data processing installation, which includes an IBM department established in 1940, also prepares weekly payrolls, maintains accounts receivable and payable, and does a highly detailed job of sales analysis by territory, salesmen and customer. Chief benefit of the system, according to James H. Dornburg, Chatam's director of market research, is that a great deal of clerical effort has been taken over and integrated into the operation. The reports and by-products in use daily would not only cost infinitely more on a manual basis, but would not even be practical, and therefore, would not be available. Mr. Dornburg feels that the company cost for this information is nominal, and he is enthusiastic concerning the marked progress of the past two and one-half years.

Seeing is believing

J. E. Sandlin, controller of the Amerotron Co., Aberdeen, N. C., where punched cards have been used for some 12 years, says his company is contemplating a switch to the IBM 1401 computer. They hope to make the conversion without seriously affecting their costs and at the same time justify the change on an economic basis. He emphasized that, "we have insisted that each data processing change give us tangible savings before making them." According to Mr. Sandlin, the most serious problem experienced by major textile companies is the cost of transferring operations from electro-mechanical equipment to electronic computers without materially increasing cost out of all proportion to the expected company gains, over a foreseeable future. He feels that new equipment like the 1401 and RCA 501, make the transition possible at greatly reduced cost and with the flexibility of adding capacity as work is placed on the machines.

Greenwood Mills, of Greenwood, S. C., added an IBM 650 to their punched card installation two years ago. The applications include production reporting, raw material control, supplies order and inventory control, and payroll. Guy S. Lang-

All data enters the American Thread system via the IBM 533 read punch unit at right. The 650 console, at center, processes it, and the 727 tape drive units, at left, record it.

ford, manager of the systems and procedures department, reports among the many benefits; reliability of data, timely reporting, improved customer service, and the "management by exception" approach to the various business problems. The Worsted Division of Excelsior Mills, Inc., has several punched card installations, the first being installed in 1958. Mr. E. A. Rice, controller, reports the major advantages as "systematizing of procedures and the orderly preparation of operating reports." In addition, he cites some benefits from reduced clerical costs.

Eliminate the negative

J. B. Dods, assistant controller of Chicopee Manufacturing in New Brunswick, N. J., a subsidiary of Johnson and Johnson, reports that his firm is planning to install an integrated system of inventory control and production scheduling for the Finishing division. For this, they will utilize a 650 tape RAMAC system, now being installed by the parent company. Dods says that Chicopee expects to improve greatly the timeliness and completeness of inventory and production planning reports.

Through the integrated system of forecasting, scheduling and inventory control, the company hopes to substantially reduce the investment in inventory. In addition, Chicopee is setting up a central production planning department which will have complete information readily available from the computer. Customer service will be improved by the establishment of scientifically developed reorder points and reorder quantities which should eliminate "out of stock" situations.

At the Cone Mills Corp. in Greensboro, N. C., James R. Perrin, assistant treasurer, says a 650 system is performing some 18 "main" applications in addition to fringe operations. Citing some of the benefits of the computer system, Perrin points out that plant payrolls are prepared in five hours instead of two days, cost of 110 fabrics can be determined in six hours instead of three weeks and weekly inventory and order position reports are now available for the previous week on Monday. Formerly the report was not ready much before a week after closing date.

"Cone Mills has realized a considerable savings through the use of a computer," Mr. Perrin stated, "both through faster and more complete reports and through a reduced clerical force." The next step in data processing will probably be a conversion to an IBM 1401 system, he added.

The American Thread Company, with headquarters in New York City, offers an excellent example of the progress made in data processing by the textile industry. The company employs about 5,500, operates eight mills, and maintains 17 branch and warehouse locations in 10 different states across the country. Its business: manufacturing and distributing threads and yarns — a total of 40,000 different products—to some 50,000 industrial and retail consumers.

Up to three and one-half years ago, billing at American Thread was done manually, as was pay-

roll, accounts receivable and all production reporting. A small tab installation was devoted exclusively to a few key sales analysis reports.

Today, the company is breaking in a large IBM RAMAC 650 tape data processing system. Billing, accounts receivable, payroll and sales analysis have already been fully mechanized. Inventory control is currently being transferred to the computer. Production planning and budget analysis will follow later this year.

The cost of the new system will run to $250,000 a year in equipment rentals, but this will be largely offset by a reduction in operating costs. The big advantage will be improved customer service, specifically the capacity to have the needed goods on hand when the customer calls. The company expects to cut days off the branch-to-mill-to-branch re-order cycle, virtually eliminating the out-of-stock situations that kill potential sales.

The company's program began in the fall of 1956. In a series of planned moves, it first installed a temporary IBM Card-A-Type billing system in the branches. Next it mechanized the accounts receivable function, then centralized its billing. About the same time the payroll operation was mechanized. Each of these moves helped set the stage for future expansion of EDP, yet only caused a minor increase in equipment rentals.

An electronic invasion

In May, 1957, a systems planning committee was formed to determine what other operating areas could be well adapted to EDP techniques. Heading the committee were Controller Williams and two vice presidents representing manufacturing, and distribution-production. Under them was a working group of five department heads representing each of these divisions plus accounting. This unit was aided by still another team of five consulting members. The committee took a full year to make its study. Every significant clerical operation was committed to writing, some of them for the very first time.

Their final report pinpointed specific areas believed open to immediate invasion by EDP and outlined supplementary applications which could profitably be added once the program was under way. The report gave a fully detailed account of expected costs and expected savings. Furnished with all the facts needed for its decisions, the company's board of directors heartily endorsed the program.

Work began immediately on a 1,650 sq. ft. data processing center in the company's New York headquarters building. Programmers were selected through tests offered to all interested clerical employes. Instruction on 650 data processing operations began. The equipment on order included, in addition to a 650 computer, two disk storage units, five tape drive units, a tape dater selector, a read punch unit, two 407 printers, 21 card punch and verifier machines and two data transceivers.

Sixteen months later, in September 1959, the equipment was installed and operating. As the various programs had previously been test-run at IBM's Endicott, N. Y., test center, the installation moved immediately into "shakedown" tests.

Guidance from New York

The staff had evolved into two separate units; one a combined programming and systems group, the other a machine operating group, both headed by data processing manager, Andrew J. Eastwick, who reports directly to Controller Williams. In the programming and systems group are one systems engineer, and four programmers. Coordinating this group's efforts with the operating team, and at the same time heading up operations, is Coordination Manager J. J. Zervos. The tabulating supervisor, heading the computer room staff of three people, and 32 employes operating card punches, verifiers and other peripheral equipment, reports to Mr. Zervos.

Fourteen other employes operate the company's three mill installations located at Willimantic, Conn.; Sevier, N. C.; and Dalton, Ga. Other smaller units operate at the four distribution centers serving the retail trade. These are located in Willimantic, Conn.; Bristol, Tenn.; Dallas, Tex.; and Turlock, Calif. All of the regional units are responsible to the local management with the New York group guiding operations in a staff capacity.

Under the American Thread system, printed shipping notices are mailed from branch and mill locations to the data processing center in New York, where they are checked and edited. Operators key punch the items ordered, quantities, prices, discount and miscellaneous data.

A card in every box

The cards are merged with customer's name and address cards and fed into the 650 system. The system then: (1) Creates an invoice tape, which later produces invoices via the tape data selector and 407 printer. This same tape is used to cut an accounts receivable card which will go into an open tub file to await customer remittance. (2) Creates a sales analysis tape for reporting sales volume by product line, cost of sales and other sales data. (3) Creates an inventory tape used to up-date finished good inventories in the RAMAC file and to test the affected stock levels and punch out re-order or expedite cards as required.

(Continued on page 48)

Comment On COBOL

By Robert W. Bemer, IBM Corp., technical advisor to the Conference Committee on COBOL.

The IBM Corporation has been active in COBOL since its formation, recognizing the desirability of such a common business language. IBM desires to implement such a language for several of its computers when it is proved feasible and reasonably efficient for the user.

The extreme difficulties of developing such a language in a short period of time cannot be overemphasized. One has only to look at the gradual evolution of English to see what thousands of options have sprung up and then disappeared.

Although it is desirable to base a business language upon a natural language such as English (obviously for the convenience of the user), there are nevertheless certain restrictions of present day computers which make the variety in English undesirable. For example, we understand a man who speaks English even though he stutters, but this is not economical to expect the machine to decode stuttering. Primarily this is because the human mind operates very much in parallel, whereas the computer of today is largely serial—at least in its scanning. A person who misses the sense of a sentence has only to reread and check a few points. If the computer has to do anything more than a single progressive reading of a sentence, such as a see-saw inspection, the cost of translation becomes prohibitive. I know of a case where it took a computer over 11 hours to produce a machine program of somewhat more than 2,000 instructions.

When the language is formalized and the latitude of options removed, or to put it bluntly, if the user restrains himself with a little discipline, this same job should not take more than an hour.

Additional complications are, of course, caused by the fact that the language must be universal and roughly as effective for each of several decidedly different computers. Compromise is necessary! Eventually such compromise is well worth it, but this is a slow process. The goal of standardization in languages is very desirable, but it will not be served if the first product, i.e., the COBOL language, fails in the field. Before such a language can be hailed as a panacea, it must be subjected to extensive field tests.

IBM has put forth a major effort in this venture, supporting it with the services of many experts in computer languages. The experience gained with FORTRAN and the Commercial Translator has been freely given. Whether the goal of a common business language is achieveable without unduly compromising machine performance is not yet proven. In this situation, it is advisable to make haste slowly that we may not raise the hopes of our customers before it is justified.

COBOL–Common

A UNIVERSAL computer language moved one step closer to reality with the announcement of COBOL (Common Business Oriented Language), a business language expected to be common to virtually all makes and models of electronic digital computers.

The new source language system will permit programmers to use English words, statements, sentences and paragraphs in communicating instructions to computer systems.

Official news of the COBOL development is anticipated momentarily from the project sponsors, the Executive Committee of the Conference on Data Systems, headed by C. A. Phillips, director of the data systems research staff, Department of Defense. The committee is a volunteer group of computer users from Government and industry and representatives of computer manufacturers.

Necessary violations

COBOL was written by the Conference's Short Range committee, directed by Joseph H. Wegstein of the National Bureau of Standards. This group, composed of technical personnel from three government agencies and six computer manufacturers, has worked continuously since June, 1959, to put the new language together.

One of the principles adopted in the development stage was that everything in the language would be correct English. This did not mean that everything which is correct English is meant to be part of the system or acceptable to a COBOL compiler. In some cases it was necessary to violate the principles of good English to allow inclusion of certain features which could not be handled by normal grammatical rules.

Language for Computers

MBA presents an exclusive account of the COBOL system, a move toward the ultimate development of a universal language for business computers

There are two basic elements to the COBOL system: (1) the Source Program, written in a common language, and (2) the Compiler, which translates this source program into an object program capable of running on a computer.

The source language is used to specify the solution of a business data processing problem. There are three elements—Procedure, Data and Environment—involved in this specification, and their names reflect the part of the over-all system which they describe. Procedure covers the set of procedures which determine how the data is to be processed. Data includes the description of the data being processed. Environment covers the description of the equipment being used in the processing. Each of the three elements are defined as a separate division of the system. The compiler's function is to integrate all of the divisions and produce the object program.

The Procedure division specifies the steps that the user wishes the computer to follow in order to produce the desired results. It allows the user to express his thoughts in English words, statements, sentences or paragraphs. Verb concepts denoting action and sentences describing procedures are basic. It is also possible to use logical situations and "if" clauses to provide alternative paths of action. The fact that the Procedure division is essentially machine-independent is one of the most important characteristics of the COBOL system. Another programmer, or any COBOL compiler, can easily understand and translate the information appearing in this division without regard to a particular computer.

The Data division uses "file" and "record descriptions" to describe the files of data that the object program is to manipulate or create and the individual logical records which comprise these files. Certain physical characteristics of the files are specifically not included—meaning that the Data division, to a certain extent, is also machine-independent.

A group of unique characters

The Environment division is that part of the source program which specifies the equipment being used. It contains descriptions of the computers to be used for compiling the source program and running the object program. Memory size, number of tape units, hardware switches and printers are among the many items that may be mentioned for a particular computer. The division has the ability to relate general program terminology to specific equipment. Those aspects of a file which relate directly to hardware are also described. Since this division deals entirely with the specifications of the equipment, it is entirely machine-dependent.

Thus, it can be seen that the amount of inter-machine compatibility throughout the COBOL system varies with the divisions and the effort taken to obtain such compatibility. The Procedure division requires virtually no effort to remain common across machines. In the case of the Data division, some care must be taken or a possible loss of efficiency may result. In the Environment division, all information is machine-dependent, therefore the compatibility is based on ease of understanding rather than direct transference.

COBOL uses 37 characters to make up the language's "words." The character set consists of the

The Short Range Committee, composed of representatives of six computer manufacturers and Government personnel, studied the strength and weaknesses of existing automatic business compilers and came up with COBOL system described here.

numbers 0 through 9, the 26 letters of the alphabet and a hyphen (or minus) sign. Seven characters are used for punctuation. These include the standard quotation marks, left and right parenthesis, space (defined as a character), period, comma and semicolon. Eight additional characters are used to define the operations involved in formulas and relations. Altogether there are 51 unique characters which are recognized by the COBOL system.

What's in a word

A word in COBOL language can be composed of not more than 30 characters. Types of words include nouns and verbs plus a special category of "reserve" words which includes "correctives," "noise words," and "key words." A COBOL noun is defined as a single word which is applicable to such elements as "Data Name," "Condition Name," "Procedure Name," "Literal Name" and "Special Register Name."

A Data Name is a word with at least one alphabetical character which designates any data specified in the data description. A Condition Name is given to a value which a field (called a conditional variable) may assume. For example, the field called "Title" is considered a conditional variable. The values which it may assume, and which are written and defined in the Record Description, are Analyst, Programmer and Coder. These Condition Names may be used in conditional expressions. As an example, if the field "TITLE" were defined as one character in legnth—and the actual values 1, 2 and 3 were assigned respectively to the Condition Names ANALYST, PROGRAMMER and CODER — the conditional expression "IF CODER THEN" would generate a test of the field "TITLE" against the value "3."

Procedure Names are applied either to paragraphs or to sections and accordingly are known as paragraph names or section names. A procedure may be named to permit one procedure in the language to refer to others, or it may be purely numeric.

A Literal is a noun which has a value identical to those characters represented by the noun. It may be numeric, alphabetic or alpha-numeric.

Special Register is a five-decimal digit field which has been assigned the name TALLY. Its primary use is to hold information produced by the EXAMINE verb. It may also be used to hold information produced elsewhere in a program.

Verbs are single words which appear in the Procedure division and designate action. Two types of action are allowed—object computer action by a special verb or compiler action denoted by a compiler directing verb.

Noise for improvement

Reserve words may be used for syntactical purposes and may not be used as nouns or verbs. Connectives are used to denote the presence of a qualifier or the presence of a subscript. Noise words are used to improve the readability of the language—but, the presence or absence of noise words does not affect the meaning of the statement. Within any division, any one or more of its noise words may be substituted for any other. Key words are required in certain formats. They are used to complete the meaning of verbs or entries and therefore must be present and correctly spelled.

Every name in a COBOL program must be unique—either because no other name has the identical spelling, or because the name exists within a hierarchy or names. The name can be made unique by mentioning several higher elements in

Continued on Page 37

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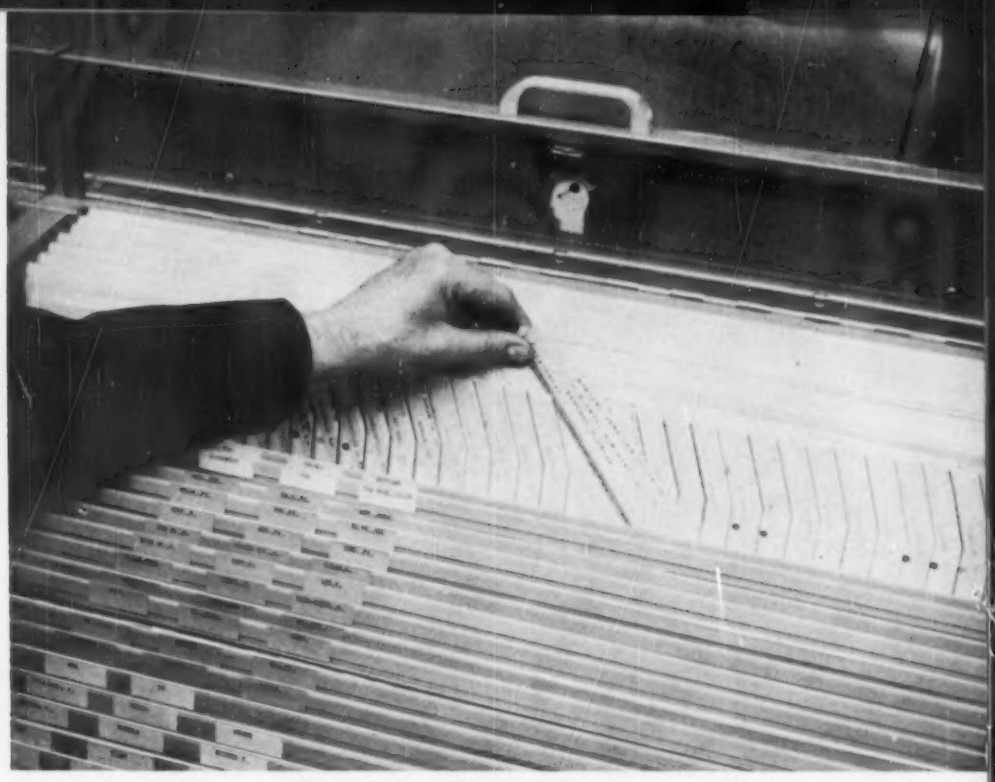


Alphabetized master tabulating cards can be pulled by an operator at the rate of two to four seconds per set, keeping pace with the automated Card-o-Matic system.

Filing System Solves Bottleneck

ARE INADEQUATE input procedures robbing your high-speed data processing system of its peak efficiency?

Management at the Craftint Manufacturing Company, ranked among the top three producers of artists' materials, learned that this was the case when it realized it had overlooked the need for streamlining the operation of manually feeding punched order-heading cards into a newly installed Remington Rand Card-o-Matic system.

Problems arising in finding and refiling the necessary input cards created an ever-increasing bottleneck at the initial phase of an otherwise smooth-flowing automated order processing and billing system. Delays at this point were reflected throughout the operations, resulting ultimately in shipment and delivery delays.

The answer to these problems was found in a visible-vertical Card Location system, which, according to Horace T. Box, Jr., comptroller, has enabled the entire operation to work as it was designed to work.

The Card-o-Matic system, installed two years ago, was designed to provide Craftint with faster and more accurate order processing, a closer control over inventory and a supply of vital and reliable sales statistics. It has effected an annual net saving of $15,000 in order filling, billing and data processing costs.

Order information, reduced to punched cards, flows efficiently from receipt to the production of documents which authorize shipment, serve as packing slips and bill the customer.

Once they were blind

At the same time, Craftint now obtains timely reports on: (1) Orders entered by product grouping and dollar volume in total (daily); (2) Orders entered by salesmen broken down by product and mail vs. direct (daily); (3) Inventory report by product (daily); (4) Accounting analysis by product of billing (daily); (5) Salesmen's report on billing (daily); (6) Salesmen's report on billing (weekly); (7) geographical reports (monthly and year-to-date); and (8) chain store reports, by chain and by product (monthly).

The bottleneck in the system occurred at the

Card-o-Matic operators prepare order-work cards by reproducing master header cards, item cards and by punching variable information from the order form.

Duplication of master name and address cards is accomplished on this Remington Rand Collating Reproducer. Master cards are then put through the machine for automatic interfiling with item cards. From these decks, listings and reports are obtained.

point where the cards entered and left the equipment. Some 10,000 punched card customer name and address sets (three or more cards per set) were filed in "blind" drawer files—over 30,000 cards in all. As orders came in, specific Master order heading tab card sets were located, pulled and attached to the order as a part of the input information reproduced into order processing cards by the Card-o-Matics. After reproduction, these master cards were manually refiled.

On a busy day, several hundred sets of these cards have to be located, pulled, attached and subsequently refiled. Search and removal proved to be time consuming and fatiguing, and refiling even slower. According to Mr. Box, the system provided "almost 100,000 opportunities a year for misfiling."

A presidential solution

The problem was further amplified by the fact that often a second order might be received from the same customer before the master cards were refiled. Confusion resulted when the clerk was unable to locate and match the master tab cards to incoming orders. The clerk didn't know if the cards existed at all, were in use, were misfiled or if a new card set was needed.

In effect, a simple job was causing unnecessary delays to an otherwise automated system. Management was aware of the problem, and it was L. S. Sanders, the president of Craftint, who helped to solve it. While visiting in Kansas City, he saw an installation of a VISIrecord Card Locating System. As a result of his inquiry, a similar system was soon put to work at Craftint.

Now the job of pulling and refiling master tabulating cards requires less than two hours of one clerk's time during a busy day (when up to 300 orders may be processed). This is a six-hour saving when compared to the old method.

Moreover, according to Mr. Box, it required two girls to pull and refile cards during peak periods. The new equipment has made it possible to release the services of one of these clerks for duties in other areas. On this basis alone, he estimated, the filing equipment will pay for itself more than twice a year.

A single clerk can pull card sets to match orders from a desk-height card record unit in only two to four seconds per set. She refiles the sets properly at eight to 10 sets a minute. As a result, the three Card-o-Matics leased are never idle, waiting for master cards. Orders have been timed from the time they are received to the point where a shipping authorization reaches the factory—in 45 minutes. This is a big step forward from the days

(before automation) when the order took two full days to reach the factory—allowing for accumulated backlogs.

Part of the credit for this speed is attributed to the new filing system. In a total space of 60 by 78 inches, the desk-level files offer a capacity of 45,000 cards, all immediately available. As orders come to the desk in random sequence, they are allowed to batch until a sizeable number is accumulated. Then, without fine sorting orders, the operator begins pulling matching master cards to accompany the orders to the punching machines.

These cards are filed alphabetically by customer name, offset in echeloned rows. Each card is indexed in a ¾-inch visible margin on the right edge of the form. Each row of about 30 cards is indexed on the strip at the top of the main dividers. No matter where the file is open, all index tabs are visible to the operator.

Look for the green spot

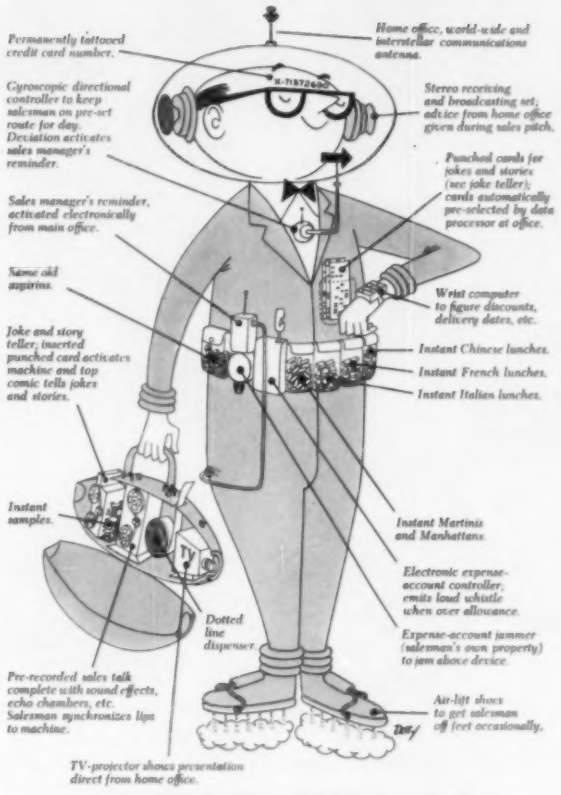
This means that an operator need only spot the correct alphabetical index on the major dividers. In a single motion she can put her hand on the exact division desired and the proper intermediate divider's grasping tab is directly engaged, behind the main divider. She flicks open the file to the row where the desired card is instantly visible.

The header card alignment is such that a green spot appears when the related tab card set is pulled. This provides a convenient card-out control, helping in the refiling or if a second order comes in from a customer while the cards are being processed.

Under the new system, refiling has also been simplified. There are 400 rows of cards separated by intermediate dividers. This means there are seldom more than two "card-out" spots showing in any single row, accelerating replacement of cards in the proper position. According to Mr. Box, there hasn't been a single instance of misfiling (or pulling the wrong card set) since the equipment was installed.

The greatest single advantage of the filing system is its speed, allowing the input of the automatic data processing routine to keep pace with the output. Like the dividend advantages gained by the Card-o-Matic system, there are other advantages from streamlined filing—including error elimination, more operator comfort and greater efficiency.

Craftint has experienced a growth factor of more than 500 percent in five years, and its management is fully aware that customer service is a major reason for this success. The benefits derived from the punched card system, especially those from sales reporting, directly influence this service. ■


Home office, world-wide and interstellar communications antenna.
Permanently tattooed credit card number.
Gyroscopic directional controller to keep salesman on pre-set route for day. Deviation activates sales manager's reminder.
Stereo receiving and broadcasting set; advice from home office given during sales pitch.
Punched cards for jokes and stories (see joke teller); cards automatically pre-selected by data processor at office.
Sales manager's reminder, activated electronically from main office.
Same old aspirins.
Wrist computer to figure discounts, delivery dates, etc.
Joke and story teller; inserted punched card activates machine and top comic tells jokes and stories.
Instant Chinese lunches.
Instant French lunches.
Instant Italian lunches.
Instant samples.
Instant Martinis and Manhattans.
Electronic expense-account controller; emits loud whistle when over allowance.
Dotted line dispenser.
Expense-account jammer (salesman's own property) to jam above device.
Pre-recorded sales talk complete with sound effects, echo chambers, etc. Salesman synchronizes lips to machine.
Air-lift shoes to get salesman off feet occasionally.
TV-projector shows presentation direct from home office.

The Compleat Salesman—1985

The above cartoon by Roy Doty is reprinted with permission from the January, 1960, issue of The American Salesman, 355 Lexington Ave., New York 17.

NEXT MONTH . . .

New System to Speed 1960 Census Results

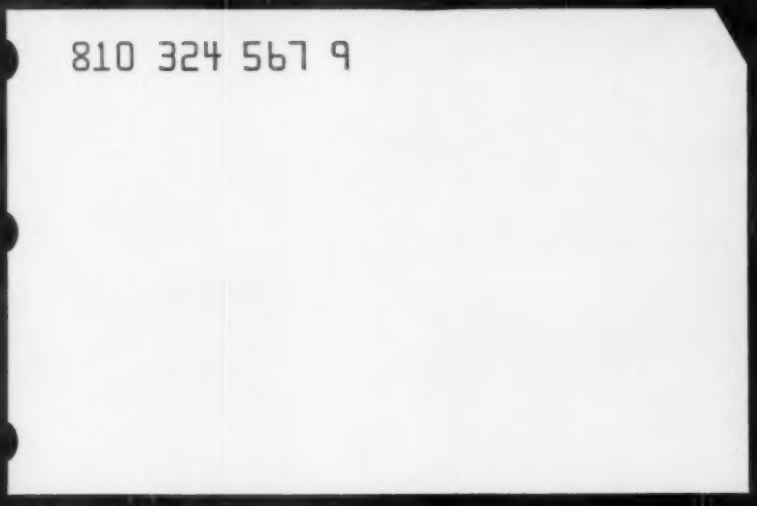
The sciences of electronics and statistics have been combined to process the largest compilation of social and economic data in the history of the United States.

•

Record Retrieval at VA

The Veterans Administration Department of Insurance has installed a "custom-built" records retrieval system to speed recovery of policy-holder information.

FROM THIS--



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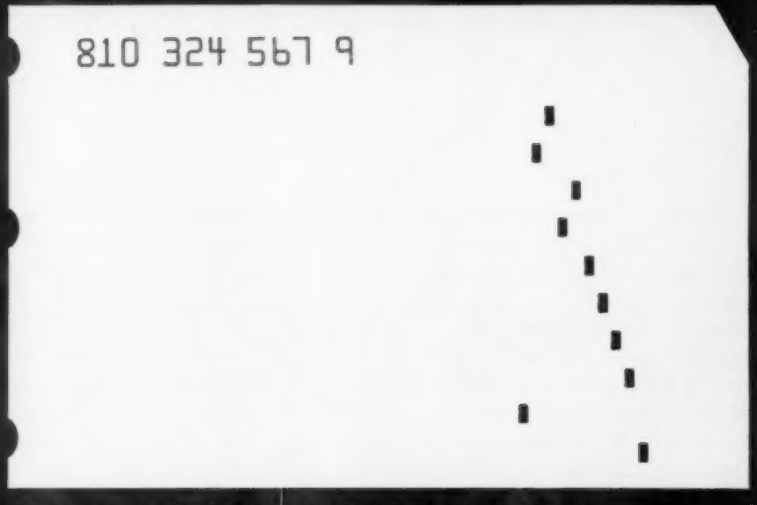

IN A WINK OF THE EYE

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The Farrington Optical Scanner (familiarly known as the EYE) automatically reads imprinted data in much the same way that you read these words. You scan each line optically. So does the Farrington Optical Scanner.

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Optical scanning offers the most flexible method for processing data cards now available, because the Farrington Optical Scanner performs a function never before automated: that of first reading common data, then translating it into the uncommon language of electronic processing machines.

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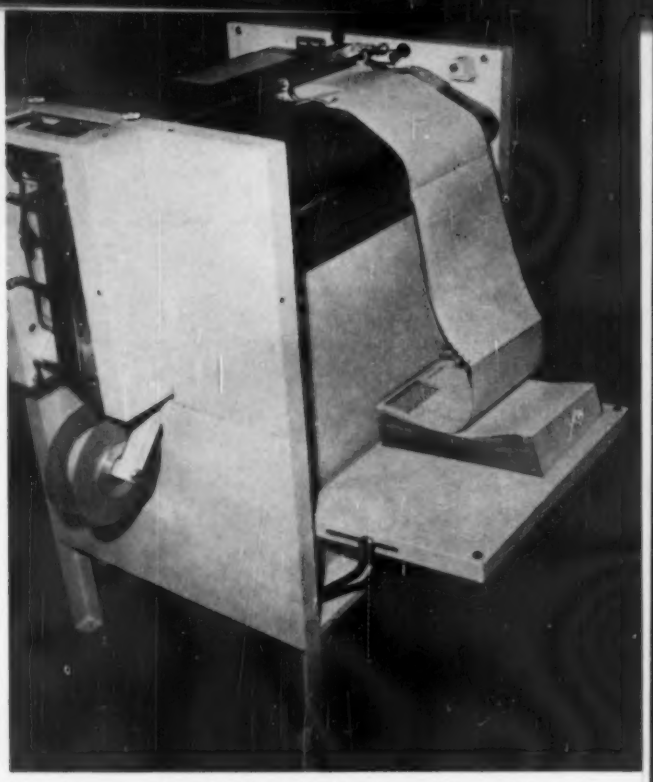
'Touch Stenciling' Process Simplifies Carton Labeling



Stencils are automatically tabbed onto continuous invoice forms by the Weber "300" Tabber at a rate of 2000 per hour.

TAKING ADVANTAGE of an automated order processing system already in operation, John H. Breck, Inc., producers of the world-famous Breck Shampoos, has speeded up shipment addressing procedures and eliminated a growing need for more space, equipment and personnel.

By making use of "Tab On" stencils, produced at the same time as the invoices, the company devised a system which is expected to realize an annual saving of $8,000 in the shipping department. Carton labeling has been reduced to a simple "touch stenciling" procedure which has greatly simplified multiple carton shipments.

The Breck Company, while best known for its shampoos, actually produces some 45 cosmetic preparations, which fall into 14 product groupings. Each item in a grouping presented its own shipping problem. A large variety of cartons, different in type and size, are used to ship the preparations, and each carton must be addressed to show its destination.

Before the new system was adopted, the company used specially designed color-printed labels on all cartons in a shipment. The labels were addressed from semi-permanent, frame-type, metal addressing plates. These attractive, but expensive, labels were rarely seen by the persons responsible for the purchase of Breck preparations, and this was one major reason why an economical solution to the labeling problem was sought by management.

Another reason was that the plate-type addressing system was forced to grow in size with the company's increasing distribution, until it could no longer be accommodated in the shipping department where space was already at a premium. In addition, it required the full-time work of two girls to maintain the plate file.

When invoices were received in the shipping department, master addressing plates were pulled from the files to match the names. Before the plates could be used for addressing purposes, a tab, which identified the last order sent to the customer, had to be removed from the frame. A new tab, showing order information for the current shipment, was then prepared on a Graphotype machine. This, in turn, was inserted into the frame, and the plates were used to run off enough labels to accommodate the number of cartons required for the new order.

After the labels were addressed, they were placed with the proper invoice and the plate returned to the master file. This procedure was repeated until all labels were addressed according to the day's invoice requirements. New plates had to be made up and incorporated into the master filing system for each new customer.

When the cartons were assembled according to

Stencil and invoice is processed at the same time. Only one stencil is needed for a multiple order.

The single stencil is "touched" to a pre-printed "Ship To" frame on each carton in the multiple shipment, eliminating the need for individual labels.

invoice requirements, the labels had to be individually moistened and applied by assembly-order men.

These operations consumed time and valuable space, and there was no prospect for increasing efficiency. At this point, management learned of the "Touch Stenciling" addressing system developed by Weber Marking Systems, Inc. Based on the use of "tab on" stencils, the system took full advantage of the fact that the company was already using high-speed IBM equipment for order processing. By integrating the two systems, the job of carton labeling has been simplified and costs cut.

In operation, the stencils are first tabbed onto IBM continuous invoice forms through the use of a Model "300" Tabber in the shipping department. The stencils, in roll form, feed through the tabber in sequence with invoice sections at a rate of 2,000 per hour. They are attached by pressure-sensitive adhesive.

The invoice forms, with stencils attached, are processed by the company's IBM department. Customer name, address, purchase order and invoice number are printed on both the invoice and the stencil. Invoices are then sent to the traffic department where the stencils and one order assembly copy are removed and sent to shipping. Other parts of the continuous invoice forms are routed to various departments for further processing.

A girl in the shipping department sorts the stencils by order for the order-assembly men. In place of the labels, which previously were pasted to the cartons, there is now a pre-printed area on each carton in the form of a "ship to" frame. The order-assembly man inserts a stencil into a hand printer and then "touches" it to each carton in the customer's order. The printer has a continuous ink supply, and the pre-printed frame locates the area for the address, so a "one touch" operation is all that is required.

Breaking down the savings realized by the new system, Arthur J. Robertson, assistant general traffic manager, pointed to an annual cash saving of $4,000 in labor costs alone. One of the girls who previously maintained the plate files has been transferred from the department and another has been given a more productive position.

He indicated that $2,850 will be realized annually as the different between the cost of the printed labels and the cost of the stencils. Equipment depreciation and replacement are two other factors which contribute to the total $8,000 which has been forecast as the annual saving. The equipment formerly used for preparing the shipping carton labels has been put to good use in the company's advertising department. ■

Dr. William E. Glenn, inventor of the thermoplastic recording system, shows that the Encyclopedia Britannica, all 24 volumes, could be recorded on the reel of tape held in his hand—at the rate of one volume per minute.

GE Unveils High-speed Recording System

An MBA News Feature

A PROGRESS report of developments to date in thermoplastic recording (TPR), a new system for the recording and storing of information, was outlined recently by scientists and executives of General Electric Co.

Described as a recording system with "very high resolution," TPR was said to combine the processing speed and much of the versatility of magnetic recording, as well as the storage capacity of photography, and to offer certain advantages over both of these systems. Since it employs new principles, company representatives advised, "much additional technical development" must be made before TPR will appear in commercial products.

Discussing the storage density requirements of modern information processing machinery, Dr. Guy Suits, GE vice president and director of research, stated that TPR would lend itself "most effectively" to advanced electronic systems for the handling of data. He added that ultimate development of TPR may present a solution to future demands for compact, flexible information systems.

Concerning the new system's role in achieving "more effective automation of business and industrial processes," Lloyd C. Harriott stated that demonstrations in GE laboratories of data storage at a density of 40 million "bits" for each square inch, "make it realistic to think of storing entire libraries of business reports in equipment the size of an office desk."

Mr. Harriott, who is manager of Control and Information Systems, General Engineering Laboratory, continued:

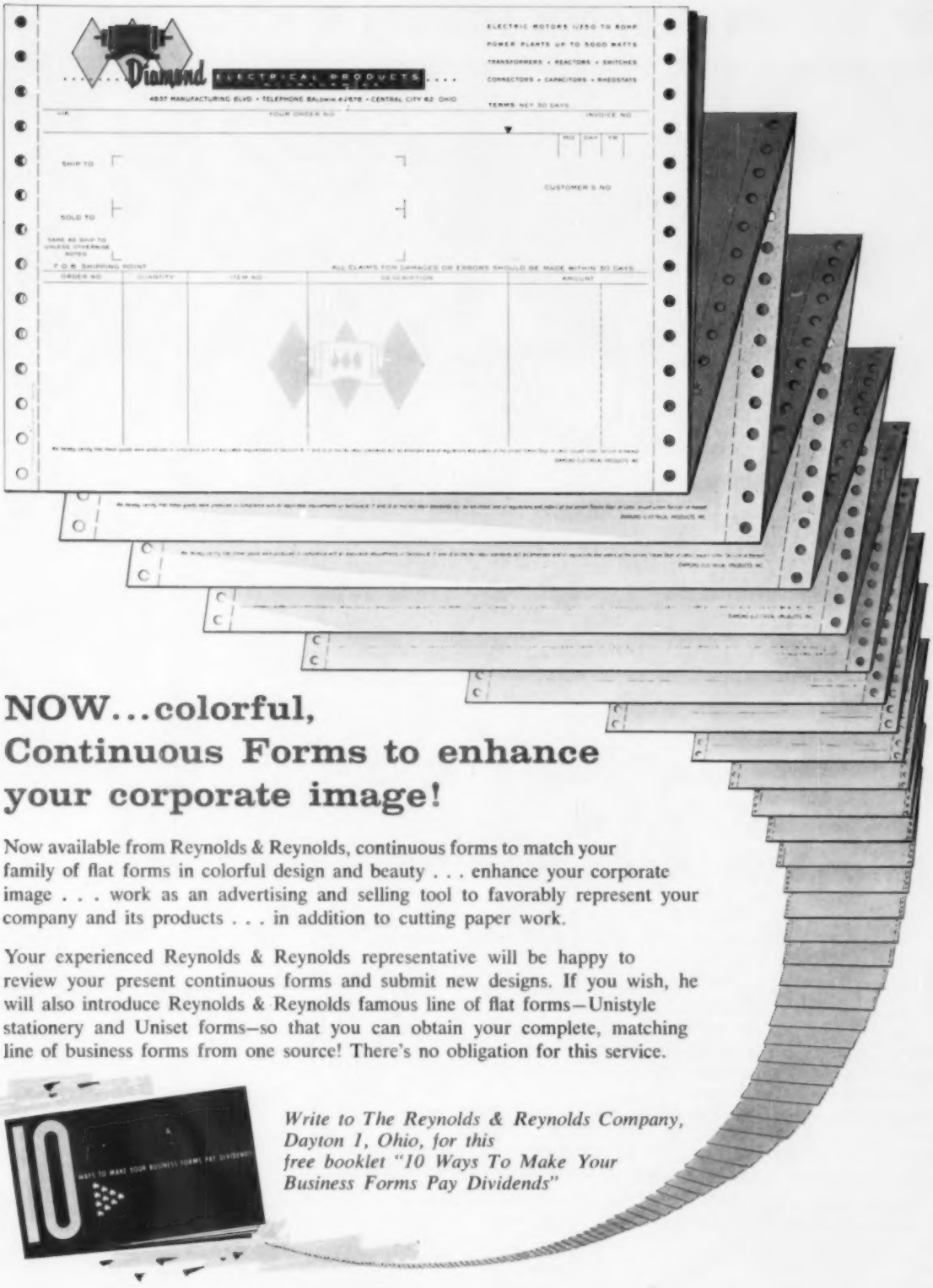
"It therefore becomes feasible, using techniques known today, to develop electronic and optical scanning and readout systems which allow for retrieval of any desired piece of information from such a library in a matter of seconds."

Since TPR provides either a direct optical projection or an electrical signal output, he continued, the delay and complexity involved in "intermediate translation" are obviated.

Although patents have been filed for TPR products, none has been issued as yet. Likewise, the company reported, neither exact dates for the release of military, or other, products, nor estimates of their costs have been determined.

In Redwood City, Calif., George I. Long, Jr., president of the Ampex Corp., major magnetic tape producer, commented on the GE announcement. He stated that "the thermoplastic process, like other experimental recording devices, has potential advantages as well as disadvantages and its future applications have been, and will continue to be, under study by Ampex."

Commenting from New York, C. J. LaBel, vice president of Audio Devices, Inc., another major magnetic tape producer, stated, "Because of the inability of the new process to erase and record a single digit, it is unsuitable for computer use. In data storage, because of the high density claimed for this new method, it may eventually allow greater compactness than the present process, but film fragility appears to be an intrinsic problem." ■



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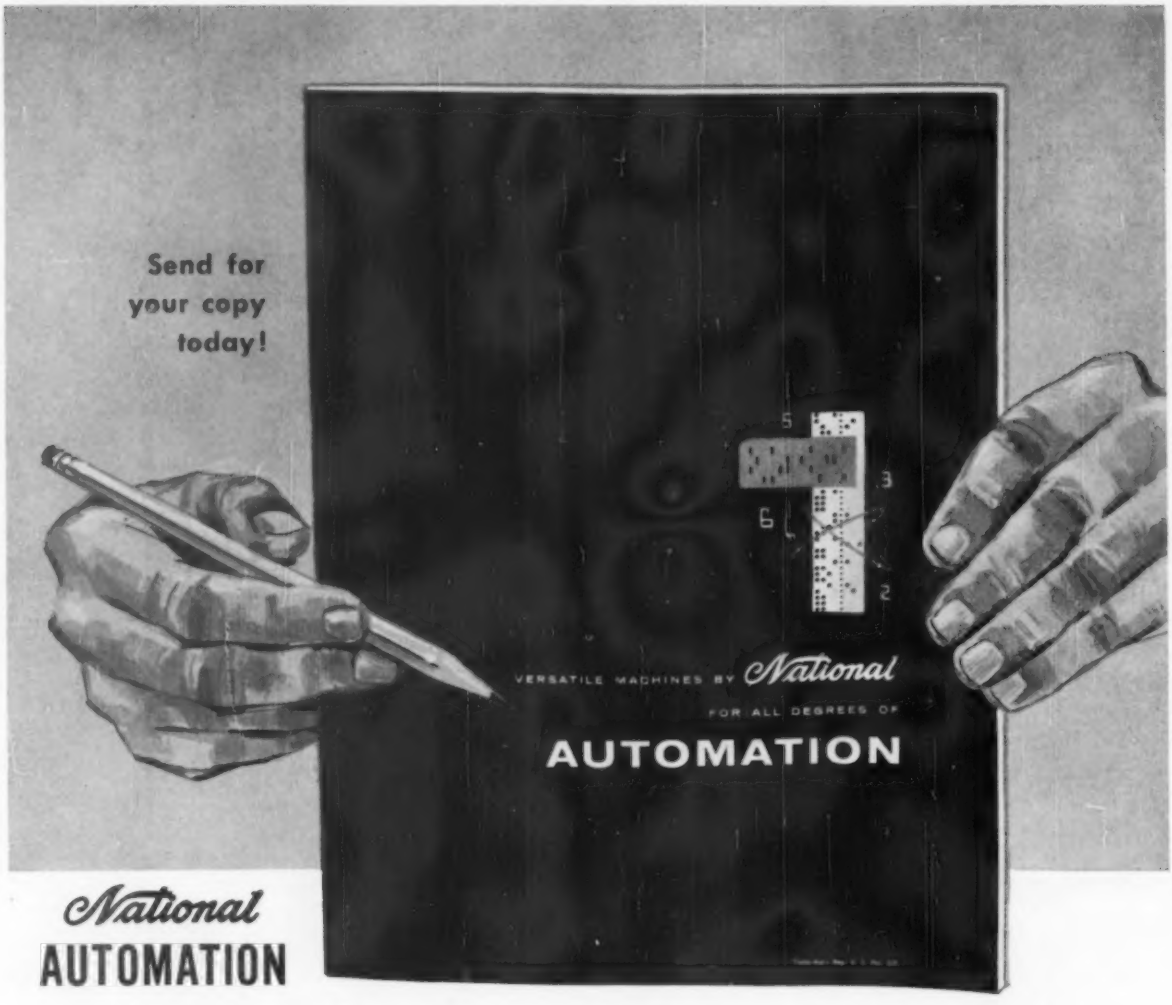

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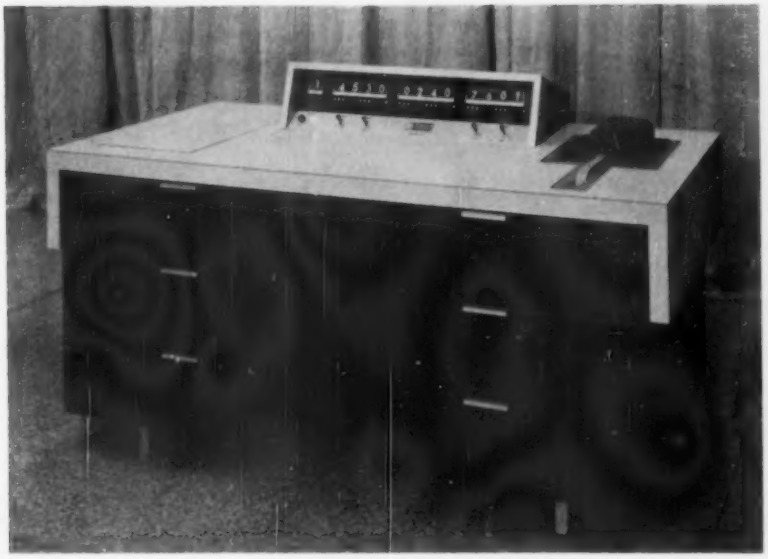
Control Data Produces New 160 Desk-size Computer



An MBA Product Preview

THE DESK-SIZE MODEL 160, all-transistorized electronic computer, has been announced by Control Data Corp.

The 160 has an array of building blocks and a magnetic core memory like those used in the Control Data 1604 — the company's new large-scale system also announced recently. It computes in terms of microseconds and can execute 60,000 instructions in one second. It is said to handle data transmissions to and from input-output equipment at speeds of up to 65,000 characters per second.

The company has set the price of the 160 at $60,000, making it available to a wide range of users. Suggested applications include statistical and business data processing, data conversion, engineering and scientific calculations, data logging and data acquisition, industrial control and communications systems.

The 160 is a single-address computer with high-speed parallel mode of operation. Storage cycle time is 6.4 microseconds. Basic add time is 12.8 microseconds. Information read is available 2.2 microseconds after start of cycle. Average execution time is calculated at 15 microseconds per instruction. The computer uses a five megacyle logic.

The company points out that full advantage of the speed and versatility of the system can be realized through its repertoire of 62 instructions and complete programming package—which includes 22-, 33-, and 44-bit fixed point arithmetic, floating point, complex floating point, decimal, floating decimal, and an algebraic compiler. Addressing modes include: no address, direct address, indirect address, and relative address. Available input-output devices include a 350 character-per-second paper tape reader, 60 character-per-second paper tape punch, electric typewriter, up to eight magnetic tape handlers, card reader, card punch, and a line printer. Circle No. 3-17

COBOL

Continued from page 24

the hierarchy. These higher elements are called "qualifiers" when used in this way, and the process is called "qualification." Two types of qualification are allowed; prefixing (i.e., adjectival modification) and suffixing. In the first instance, the nouns must appear in descending order of hierarchy (i.e. with the name being qualified as the last and all others in order). In the second case the nouns must appear in ascending order of hierarchy with either of the words "OF" or "IN" separating them (the choice between the two words is based on readability — they are logically equivalent).

Dimensional arrays

Taking "President Election Year" as an example, the hierarchy of data given is such that neither the field "YEAR" nor the field "ELECTION" are unique spellings. That is, both fields appear elsewhere in the Record Description. To reference the "YEAR" field, PRESIDENT and ELECTION are used as qualifiers, either as nouns used adjectively in a prefix (PRESIDENT ELECTION YEAR), or preceded by the connective "of" for a suffix (YEAR OF ELECTION OF PRESIDENT).

When a list of items is defined in a program, reference may be made to any particular one by "subscripting." The list may not be referred to with subscripts. The name being subscripted is followed by the subscript which is identified either by following the key word "FOR" or by being surrounded by parenthesis. In certain situations, complex tables may be defined which require more than one quantity to locate an item. COBOL permits arrays containing up to three dimensions. The order of subscripts, from left to right, is major, intermediate and minor. For example, the premium rate of an insurance policy might depend upon the age, weight and the state of residence of the policyholder. The table would be classified as three dimensional and each valid subscript must be a series of three words. Paren-

Continued on next page

COBOL

Continued from page 37

theses must be used in this case because the key word "FOR" might be ambiguous. The resulting instruction would read: MULTIPLY POLICY-VALUE BY RATE (AGE, WEIGHT, STATE).

COBOL procedures are expressed in a manner similar (but not identical) to normal English prose. The largest unit is a section, which is composed of paragraphs. The latter is made up of sentences which are generally grouped for the purpose of describing a unified idea. The sentences are composed of sequences of statements, which in turn are made up of groups of words—normally verbs and operands. COBOL makes available to the programmer several means of expressing logical situations through the use of the "conditional" procedures. These "conditionals" generally involve the key word "IF" followed by the condition to be examined, followed by the operations to be performed. The operations may vary, depending upon the truth or falsity of the conditions. For example: IF X EQUALS Y, MOVE A TO B; OTHERWISE IF C EQUALS D, MOVE A TO D AND ALSO PERFORM X THROUGH Y.

On the level

Under the COBOL concept, data to be processed falls into three categories—that which is contained in files and enters or leaves the internal memory of the computer from specified areas; that which is developed internally and placed into intermediate or working storage, and constants which are defined by the user. For purposes of processing, the contents of a file are divided into logical records. By definition, a logical record is any consecutive set of information. In an inventory transaction file, for example, a logical record could be defined as a single transaction, or as all consecutive transactions which pertain to the same stock item. Several logical records may occupy a block (i.e., physical record), or a logical record may extend across physical records. The logical record concept is not restricted to file data, but carries over into the definition of working storages and constants which may be grouped into logical entities and defined by a Record Description.

"Individuality and creativeness can still flourish freely within the framework of effective language standards."—C. A. Phillips, chairman of the Executive Committee of the Conference on Data Systems.

File Description entry contains information pertaining to the physical aspects of a file; the manner in which the data is recorded on the file, the volume of data in the file, the size of the logical and physical records, the names of the label records contained in the file, the names of the data records which comprise the file, and the keys on which the data records are sorted. The listing of data and label records in a File Description entry serves as a cross reference between the file and the records it contains. If the Record Description for these records is not found within the Data division of the problem description, it still can be automatically called from the COBOL library.

A Record Description consists of a set of entries, each of which defines the characteristics of a particular unit of data. Since COBOL Record Descriptions involve a hierarchal structure, an entry giving only the general characteristics may be followed by a set of subordinate entries which together redescribe the unit in more specific terms. The contents of an entry may vary considerably, depending upon whether or not it is followed by subordinate entries. A file of job tickets sorted according to division, department, employe number and day of the week is a good example of this. If the logical record has been defined as all consecutive data pertaining to a single employe, the following levels could be defined: (1) A weekly job record which consists of . . ., (2) Daily job ticket groupings which consist of . . ., (3) Job tickets which consist of . . ., and (4) The individual fields within the job tickets.

Within a COBOL Record Description, the programmer organizes and defines data according to its relative level by writing separate entries for each level and for each item of data within each level. The definition of a particular item of data consists of the entry written for that level plus all following entries which are of a lower level. The level, itself, is shown by a level number which is relative to the largest element of data within the Record Description. Level numbers start at 1—for records—and may go as high as 49, but it is not expected that any problem will require the full 49 levels of data.

Divided Divisions

The Environment Division is the one part of the COBOL system which must be rewritten each time a given problem is run on a different machine. It has been included in the system to provide a standard way of expressing the machine-dependent information which must be included as the part of every problem.

The division has been divided into two sections — Configuration

and Input-Output. The Configuration section deals with the over-all specifications of computers and is divided into three paragraphs: the Source-Computer, which defines the computer on which the COBOL Compiler is to be run; the Object-Computer, which defines the computer on which the program produced by the COBOL Compiler is to be run, and Special Names, which relate the actual names of the hardware used by the program to the names used in the program.

The Input-Output section deals with the definition of the external media and that information that will create the most efficient transmission and handling of data between the media and object program. The section is divided into two paragraphs: the I-O Control, which defines special input-output techniques, rerun, and multiple file tapes; and File-Control, which names and associates the files with the external media.

In the beginning

The COBOL Library contains three types of entries, corresponding to the three divisions of the COBOL system. Information describing machine configurations is retrievable through the use of the Copy in the Environment division. File and record descriptions are retrievable through the use of the Copy in the Data division. Procedure statements—commonly called subroutines—are retrievable through the use of the verb INCLUDE in the Procedure division. Each division is capable of obtaining material pertaining only to itself. The physical makeup of the COBOL library, as well as the maintenance and handling, are left to the individual implementor. The calling of library material produces the same effect as if the programmer had written the material in his source program.

COBOL had its beginning at a conference held at the University of Pennsylvania Computing Center on April 8, 1959. The meeting brought together a group representing users, manufacturers and universities to discuss the problem of developing a common business language. The group, headed by Phillips, observed the recent development of languages for automatic programming, such as Sperry-Rand's FLOWMATIC, IBM's COMTRAN, and AIMCO, developed jointly by the Air Material Command and Sperry-Rand. The conclusion was that it might be feasible to develop specifications for a problem-oriented but machine-independent common language for business problems. The Department of Defense, as an appropriate agency with a major interest in the field, was asked to undertake the project.

Action in the Pentagon

On May 28, 1959, a two-day meeting was called in the Pentagon by Phillips to discuss the organization of the project. The concept of three committees, Short Range, Intermediate Range, and Long Range, was agreed upon with appropriate time schedules. The Short Range Committee was composed of six manufacturers, Government representatives and the chairman, Mr. Wegstein. Its task—to accomplish a fact-finding study of the strength and weaknesses of existing automatic business compilers and develop an improved system. Members of the group include: Col. Alfred Asch, Capt. Erwin Vernon and Duane Hedges of the Air Material Command-USAF; Robert S. Barton, William Logan and Mrs. Mary K. Hawes of Burroughs Corp. (Mrs. Hawes is now with RCA); Howard Bromberg, Ben F. Cheydleur, Norman Discount, Karl Kozarsky, Rex McWilliams and Gerald Rosenkrantz of Radio Corp. of America; William Carter, Charles Gaudette and Miss Sue Knapp of Minneapolis-Honeywell (Mr. Carter is now with IBM); Miss Deborah Davidson, Vernon Reeves and Miss Jean E. Sammet of Sylvania Electric Products, Inc.; William Finley, Dan Goldstein and Edward F. Sommers of Sperry-Rand; Roy Goldfinger, William Selden and Miss Gertrude Tierney of IBM; Mrs. Frances E. Holberton and Mrs. Norah Taylor of David Taylor Model Basin, USN, and Roy Nutt of the Computer Science Corp.

The Intermediate Range group will take the COBOL package and begin to modify and refine it within a time schedule ending sometime in 1961. Chairman of the group is A. E. Smith of the Navy Department.

The final phase of the program is the responsibility of the Long Range committee. This group will explore the fundamentals and philosophies of all machine language, regardless of its use on scientific or business data problems. The objective is to develop a "super" language which might supersede all existing scientific and business language systems. Such an accomplishment would be the ultimate—the Universal Computer Language. A special subcommittee, consisting of Robert Curry, vice president and comptroller of Southern Railway; Howard Engstrom, vice president of Sperry-Rand, and John McPherson, vice president of IBM, is directing this effort.

Trial of a concept

Assisting the Conference Committee as technical advisors in all phases of the COBOL project are Dr. Grace Hopper of Sperry-Rand, and Robert W. Bemer of IBM.

As the Short Range committee report points out, the COBOL system is the first large-scale effort at writing business data processing problems for many computers in one language. As such, it will undergo the trials of any new concept. Improvements and additions will be made by the committee which has stated that it is making "every effort to insure that improvements and corrections will be made in an orderly fashion." Proper provisions have been taken to avoid invalidating existing users' investments in programming.

The COBOL system further marks a major move toward complete computer compatibility. Other benefits include a reduction in the time requirements and costs of programming. The program has the complete support of the computer industry, and manufacturers have agreed to implement the language with compilers or processors to translate COBOL to the language of their particular machines. They recognize, Chairman Phillips pointed out, that individuality and creativeness can still flourish freely within the framework of effective language standards. ■

The "Masterfax" can make direct process masters, offset masters, facsimile copies, and it can laminate documents, all with a simple setting of the dial.

'Masterfax' Is Four-In-One Duplicator

An MBA Product Preview

FOUR office duplicating functions have been wrapped up in one compact unit, the new Ditto, Inc. "Masterfax."

The Masterfax is credited with performing four jobs: (1) It will make direct (spirit) process masters; (2) It will make offset masters; (3) It will make facsimile copies; and (4) It laminates.

No carbon is required during the typing or preparatory stage since the material to be duplicated is typed, written or drawn directly on a white Masterfax sheet. This is inserted into the machine along with a carbon to produce the direct process master. Such masters can also be made from original copy, such as newspaper clippings, correspondence, reports or other material not necessarily prepared on the Masterfax paper.

To produce an offset master, a paper mat is included with the original and carbon and the assembled set is placed in the machine. The operator makes a simple dial adjustment and closes the top. The master is ready for use in 15 seconds.

A third and important function of the machine is its ability to make facsimile copies. The copy is black on plain white paper, and the process is completely dry. The unit will make facsimiles on any weight or grade of paper including card stock, gummed labels or even on cloth.

Ogden White, vice president of marketing, stated that the Masterfax will make facsimile copies at a "much lower" cost than other copying processes.

The fourth facet of Masterfax is that it can laminate papers, documents and other literature with a plastic coating. No complicated adjustments or change-overs are required. The item to be laminated is placed into the machine with a sheet of laminate, and the job is finished in less than a minute. Circle No. 3-14.

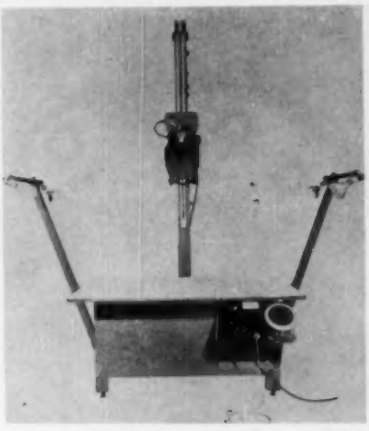
MBA Showcase

New Products for Business Automation

Desk Mailing Machine

A new, compact postage meter machine, which seals, stamps and stacks letters in one operation, has been introduced by Pitney-Bowes, Inc. Model 5500 will be offered at a low cost but will provide the standard advantages of all metered mail machines. It also has a stamp value range from one-half cent to $1.09½ in a single stamp. Lightweight case, envelope stacker and tape dispenser are standard equipment. Circle No. 3-2

Microfilm Package Plan



New microfilm package plan that combines a camera, film, Universal Processor, Uni-Kards and a reader has been announced by Remington Rand. The company states the package is to be offered at $7,295. The camera, shown here, is a power-driven, nine-position planetary unit which can handle documents and large engineering drawings. Over 5,000 documents can be photographed on a 100-foot roll of film. Circle No. 3-4

Teller's Machine

The Class 42 all-purpose teller's machine is now available from National Cash Register Co. The unit can handle all types of counter transactions, such as commercial deposits, cash in, cash out, savings deposits, savings withdrawals, interest, loan payments and miscellaneous receipts and disbursements. It provides for 10 separate totals of transactions and three separate printing positions. One printing position is used to print each transaction on a locked-in audit journal. Circle No. 3-12

SoundScriber's New "Satellite" System

SoundScriber Corp. has introduced its new line of dictating equipment which features a "Satellite" system permitting up to five people to share a central transcriber. Push buttons control the remote microphone units, allowing playback, corrections and indexing. A special "magic memory" returns the disc to the spot where dictation left off. Circle No. 3-6

Field Tape Punch

The Burroughs P1100 tape punching unit has been designed for point-of-sale or branch office use when transactions are controlled by a centralized data processing office. The machine is said to be simple to operate and low in cost, offering up to 13 columns of keys, printing and adding, plus rotary date and rotary numbers where needed. Up to 22 characters are punched sequentialiy and simultaneously with the printing. Circle No. 3-1

IBM Unveils Large Scale 7080 Computer

The solid state IBM 7080 data processing system, announced by the company in January, is said to be the most powerful computer yet designed specifically for business applications. It has processing speeds up to 10 times faster than the present IBM 750 systems. The 7080 is capable of producing management reports and processing payrolls, inventory control, billing and similar accounting jobs at a substantially lower job cost than the previous systems. A typical 7080 will sell for $2,528,000 and rent for $55,500 a month. The system accepts major 705 programs. Circle No. 3-9

Portable Collator

A desk-size, portable collator, developed for offices which do not require elaborate equipment for gathering multiple pages, is now offered by A. P. Heinz Co. No skill is required for a person to assemble 6,000 pages per hour, including time to jog and set sheets aside. The unit is aluminum and occupies only 1½ square feet of desk space. Each of 12 stations holds 300 sheets up to 17 by 11 inches in size. Circle No. 3-13

Acoustical Cabinets for Data Processing Machines

A completely restyled 1960 line of Acoustinet cabinets for data processing, accounting, addressing and communication machines has been unveiled by Gates Acoustinet, Inc. Various units have been designed to fit specific pieces of equipment. All have two and one-half-inch thick walls lined with highly absorbent acoustical material. The enclosures also provide fluorescent indirect lighting. Circle No. 3-8

filing Flexibility unlimited!

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Data Accumulator

The Telecordex Model 180 is a multiple input recording and indicating data accumulator which records and stores sequential measurement pulses. Bi-directional input pulses at rates up to 15,000 per second can be accepted from measuring devices. Output of the system can be recorded by electric typewriters at 600 characters per minute, by keypunch or summary punch at 50 cards per minute or by tape perforator. From Telecomputing Corp. Circle No. 3-10

High-Speed Printer-Plotter System

New high-speed printer-plotter system designed by Briggs Associates, Inc., makes large computers more eloquent by plotting out graphical or printed data at 300,000 points per minute from computer-processed magnetic tape. The company points out that the unit permits computers to print out data almost as rapidly as they can process it. As a straight printer, the system can print out 90,000 magazine or address labels an hour. Uses have also been foreseen in computer accounting and records-keeping areas. The equipment is a high-speed, sub-matrix, electrolytic system. Circle No. 3-11

Burster Attachments

Three attachments increase the versatility of the Divi Burster now available from the Egry Register Co. The attachments are an imprinter, tab card buster and a Verti-Liner. The latter is a development which adds vertical lines to continuous forms as they are separated and trimmed. The imprinter adds signatures to checks or information to continuous forms going through the unit at 25,000 an hour. Circle No. 3-7

Magnetic Inkscope

The American Optical Co. has developed the AO Magnetic Inkscope, an instrument for quick and simple checking of magnetic ink characters to determine accuracy of horizontal and vertical locations, field boundries, character spacing and alignment and average edge tolerances. It also reveals ink spread, ink coverage, voids and extraneous ink. Two reticle discs are available for inspection and production, and both are designed to meet the requirements of printer, bank or other data processors. Circle No. 3-5

Forms Feeder

The Flexible Formaliner announced by Moore Business Forms, Inc., permits users of regular electric typewriters to convert the machine at will to a continuous marginal punched forms feeder. The unit snaps on and off permanent plates mounted on either side of the carriage, and it operates in the same manner as regular accounting machine tractors. The tractors can be slid aside or snapped off when not in use. The platen need not be removed for installation. Circle No. 3-3

Copies On Request

The following booklets, catalogs and brochures are considered of interest to readers of MANAGEMENT and BUSINESS AUTOMATION. Copies can be obtained by using the convenient Reader Service Card and circling the corresponding key numbers.

The Royal McBee Codewriter—is described in a new brochure available from the company. The input model, output model and combination input-output models are described. A typical application is shown in flow chart form. Circle No. 3-25

A Labeling System — Addressing multiple shipments using the Sten-C-Labl system is described in a new brochure released by Sten-C-Labl Inc. A step-by-step explanation of the system, with photographs, covers the preparation and end use of the labels. Circle No. 3-26

Data Processing Planning Kit—Tab Products Co. is offering a free planning kit for data processing departments. It includes a folder enclosing a scaled planning grid and a complete series of pressure sensitive templates. All are to scale. Circle No. 3-27

Paper Tape Accessories—for the Bendix G-15 digital computer are described in a newly issued single-page data sheet. Those covered include the PR-1 Auxiliary Photoelectric paper tape reader, the PR-2 Multicode high-speed reader, and the PTP-1 Auxiliary Paper Tape Punch. Circle No. 3-28

Microfilm Techniques—"Let's Take a Positive Look at Microfilm" is the title of a booklet from Minnesota Mining and Manufacturing Co. which was written by Edward Rosse, head of the Social Security Administration's microfilm program—one of the world's largest. He explains the basic uses and draws upon experiences in setting up his own department's program. Circle No. 3-29

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For More Information Circle Reader Service Card No. 3-72

NEWS

Computer System for a TV Quiz Show

Any television quiz show of the future could avoid the "fixed" label if the producers take advantage of

C. D. Bell

a new computer system developed by Codie D. Bell, vice president and actuary of Pioneer Mutual Life Insurance Co., Fargo, N. D.

Bell's system, called "Selectro" or "Selectron" (coined from selection by electronics), involves the use of an electronic computer in selecting the quiz show candidates, the questions and answers, and even the prizes.

The computer, according to Bell's plan, could scan previously registered contestants and come up with those who seem well-qualified to answer questions on the subject chosen. The questions themselves would then be chosen by the computer.

"Since the computer can scan 200,000 or more six-digit numbers," Bell pointed out, "it would be impossible to rig the machine to stop at any previously selected item."

As far as it goes, the contestant could push a button to get his question. If he answered it correctly, the computer could go one step further and award the prize on the basis of the contestant's ability and the difficulty of the question.

Bell envisions a nation-wide quiz show of contestants chosen at random by the computer from previously stored information. All those who wished to compete could register with the program, and during the program the computer could do the selecting of the contestants.

Bell said his basic idea is programmed for existing computer equipment. Certain pieces of auxiliary equipment, if used, would have to be constructed, he added.

He has copyrighted the material setting forth his ideas.

Bell's knowledge of the workings of the equipment stems from his study of systems used in insurance work, and he is certain that his idea could regenerate an interest in the now "dead" quiz shows.

Philco Corp. Forms New Computer Division

The formation of a separate computer division by the Government and industrial Group of the Philco Corp. was announced recently.

It will be located in the company's new Willow Grove, Pa., plant, permitting an expansion of both production and research.

The Philco large-scale 2000 system and the new medium-scale C-3000 system are now in production.

BFI Elects Officers

Lester J. Johnsen, executive vice president of the Atlantic Register Co. has been elected president of the Business Forms Institute, trade association of the manifold business forms industry.

The group, meeting in New York February 17-19, named Robert A. Addison, National Carbon Coated Paper Co., as first vice president, and Thomas A. Taylor, Schwabacher-Frey Co., second vice president.

ITT Demonstrates New Transmission System

"Pulse Code Modulation," a method of transmitting live television pictures or telephone calls, is now being demonstrated by International Telephone and Telegraph Co. in England.

A hollow "pipe" consisting of specially treated aluminum wire, formed like a tightly coiled spring, carries the messages in a method similar to what engineers call waveguide. Waveguide was previously limited by a great loss of signal strength over any distance and the inability of the signal to follow the curvature of the earth.

Using PCM, ITT is sending both TV pictures and telephone calls 3,600 feet, and greater distances can be covered by the use of repeater units to boost the signal strength.

Ultimately the technique could provide simultaneous transmission of as many as 400 television channels or several hundred thousand telephone conversations, ITT engineers stated.

Shoe Manufacturer Installs Computer

The Endicott Johnson Corp., New York shoe manufacturing concern, has put a RAMAC 650 tape system by IBM into action.

The electronic data processing equipment is said to be the first of its kind in the shoe manufacturing industry.

Frank A. Johnson, president, said the computer installation represents a key move in his company's program to provide the best possible service to the more than 24,000 retail outlets which annually sell 54 million pairs of shoes. It will control work flow through three plants at the beginning, eventually moving to do the same for all 27 factories in the Endicott area.

Western Systems Conference Planned

The five Southern California chapters of the Systems and Procedures Association have completed plans to sponsor the second annual Western Systems Conference at the Statler-Hilton Hotel in Los Angeles.

The date chosen for this year is May 26. For further information, readers are asked to contact George Ryan, 6986 Bandini Blvd., Los Angeles 22, Calif.

Southern Railway Orders IBM 7080

The Southern Railway System, pioneer user of business data processing equipment dating back to 1906 when it became the first company to use the Hollerith punched-card machines, has ordered the large-scale IBM 7080 computer system.

This new system will replace a 705 Model II, which was also the first of its kind to be installed for commercial use. Southern plans to supplement the 7080 with two 1401 systems in its Atlanta, Ga., computer center and a third at the Washington, D. C., office. The latter will be used for corporate accounting, disbursements and reports.

Smith-Corona Appoints Communications Manager

John H. Adams has been named to the position of sales manager of communications systems for the Data Processing Systems division of Smith-Corona Marchant, Inc.

He will be responsible for commercial sales of printed communications and data transmission systems produced by the Kleinschmidt division of SCM, including its full line of teletypewriters, tape perforators, tape sending and receiving devices and other systems.

The Data Processing Systems division was recently formed to handle the development, sales and servicing of equipment in the data processing field.

Bendix to Expand Computer Plant

The Computer division of Bendix Aviation Corp. is planning to build a complete new plant adjacent to its divisional headquarters in Los Angeles to increase production of its G-15 digital computer and accessories.

The company, according to Maurice W. Herrell, general manager, is expecting a 50 percent increase in production.

Uarco Names Two To New Positions

Uarco, Inc. has named Mrs. Lois Richards to the position of manager of Systems Planning, and at the same time advanced William W. Zechel, who held the post, to Product Manager.

Mrs. Richards, who is recognized as one of the top data processing

Mrs. Lois Richards

specialists in the country, will direct the firm's Chicago staff of systems planners and will have functional control of systems planners in other sales headquarter cities.

Mr. Zechel, in his new capacity, will direct the company's program for promoting the sale of custom control punched business forms, supervising both research and development of new applications.

Huge Balloon Protects Post Office Equipment

Even while the outside walls of "Project Turnkey," the new U. S. Postoffice at Providence, R. I. (MBA, Dec. '59) are going up, this giant, vinyl-covered balloon protects the installation of ITT automatic sorting and mail handling equipment.

Recent Appointments

STROMBERG-CARLSON—James D. McLean has joined the General Dynamics Corp. as president of the S-C division. He will also become a senior vice president of the parent company. Mr. McLean was formerly president of the Hoffman Laboratories division of Hoffman Electronics Corp. in Los Angeles.

FRIDEN, INC. — Wesley E. Jenkins has been named as sales manager of the Mailing Machines division. The company has, within the past six months, acquired two mail equipment companies, Cummington Corp. of Boston, and International Postal Supply Co. of New York. These units now form the International Postal Supply division in Lewiston, Pa.

Textile Industry

Continued from page 21

Controller Harold E. Williams has piloted the development of EDP at American Thread.

The company furnishes retail customers with re-order cards for every box of goods shipped. Inserted at the mill, each card is pre-punched with item number, quantity, size and color. When mailed to an ATCO branch, the card represents a re-order for that same merchandise. It is merged with customer's name and address card and fed into an IBM 402 accounting machine. Out comes a detailed packing slip, copies of which guide preparation of the order for shipment and serve as a source document for writing the invoice later on.

RAMAC and raw cotton

Work will soon begin on another major phase of the program—production control. The plan here calls for complete control of the so-called "finishing" part of the company's operation. The processing of thread and yarn divides into two parts, first, the spinning and twisting operation which converts raw cotton into twisted and plied cotton strands, or "grey yarn," as it is called; and second, the finishing operation in which this grey yarn is mercerized and/or dyed and wound for final shipment to the trade.

The RAMAC file will maintain in-process inventories at each of 21 check points in the finishing process. RAMAC will also keep track of each process order as it moves through the finishing mill. Every process order fully describes the item involved, lists the processing sequence and specifies the exact machine groups used.

"Turn-in tickets," recording each day's production, will be "transceived" over telephone wires to New York each night. On the basis of this information, the system will: (1) Update its RAMAC inventory files on finished goods, in-process goods and so-called grey yarn. (2) Issue reports on departmental backlogs, machine loads, the status of process orders and other data needed for effective production scheduling.

The company's mill management group sees in this system an opportunity to further increase efficiency and reduce operating costs. They reason that by completely scheduling the finishing operations, the need for safety allowances that commonly attend production scheduling will be reduced. Operations will be trimmed down all around and processing bottlenecks will be clearly revealed. Company officials estimate that to achieve equivalent efficiency without the 650 system, would require the full time services of almost 100 persons.

One other realm the American Thread system will soon enter is expense and budget accounting. Expense distribution cards will be created for each purchase and used to prepare expense distribution reports by department. These, in turn, will be compared to the budget for the items involved, and an analysis will be drawn off for departmental and divisional guidance.

In the textile industry—where low investment requirements and a well-known technology have made competition, both domestic and foreign, increasingly stiff—progressive firms are looking to systems like the one at American Thread to give them an edge in service—an edge that will convert to an increase in sales as time goes on.

As C. E. Bowne, American Thread vice president of industrial sales has said, "There is no monopoly on the art of manufacturing industrial sewing thread. All manufacturers work, basically, with the same raw materials, equipment and chemicals. These come from manufacturers who keep their customers well-informed as to what is going on within the industry. There are very few secrets."

Thus, in textiles, operating efficiency has become the sole route to security. In this challenging environment, data processing, though getting a late start, is enjoying one of its greatest successes, to date. ■

MBA's Calendar

March 21-24—IRE National Convention. In the Coliseum and Waldorf Astoria Hotel, New York City.

March 23-25—Career Management Conference Clinic sponsored by the National Machine Accountants Association, Chicago, Conrad Hilton Hotel. Contact Ken Iles, P.O. Box 1620, Chicago 90.

March 24-25—Northeastern Divisional Data Processing and Computer Conference, NMAA. Sponsored by New York Chapter at Statler-Hilton Hotel, New York City.

March 26—Fourth annual symposium on recent advances in programming methods conducted by Central Ohio Association for Computing Machinery. Contact R. K. Kissinger, c/o Nationwide Insurance Co., 246 N. High St., Columbus, Ohio.

March 29-April 1—13th annual Southern California Business Show sponsored by Los Angeles Chapter, National Association of Accountants. Hotel Ambassador, Los Angeles.

April 5-7—1960 Spring Meeting of the Railway Systems & Procedures Association. The Morrison Hotel, Chicago, Ill. Contact E. E. Numrich, Chicago, Burlington & Quincy R. R., 547 W. Jackson Blvd., Chicago 6, Ill. Room 500.

April 8-9—Third annual Regional Data Processing Conference, NMAA, Syracuse, N. Y. Contact Robert Bell, Drug Trading Co., Ltd., 15 Ontario St., Toronto, Ontario, Canada.

April 18-19—Third Annual Conference on Automatic Techniques, Cleveland-Sheraton Hotel, Cleveland, Ohio. Jointly sponsored by the ASME, AIEE and IRE. Write J. H. McRainey, Room 530, 1213 W. 3rd St., Cleveland 13, Ohio.

April 22-23—Greater Cincinnati NMAA chapter sponsoring Southeastern district regional conference, Hotel Netherland Hilton, Cincinnati. Write chapter at P.O. Box 863, Cincinnati 1, Ohio, for information.

May 3-5—The 1960 Western Joint Computer Conference, Jack Tar Hotel, San Francisco.

May 22-27—41st International Conference and Annual Exposition of the National Office Management Association. Queen Elizabeth Hotel, Show Mart, Montreal, Canada.

May 23-24—Federal Government Accountants Exposition and Meeting, Statler Hotel, New York City.

June 22-24—National Conference and Business Show of the National Machine Accountants Association, San Francisco, Calif. Mark Hopkins and Fairmont hotels and California Masonic Memorial Temple for exhibits. For information, write P.O. Box 3617, Rincon Annex, San Francisco 19.

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EDITORIAL

The High Cost Of Computer Babble

The creation of a modern Tower of Babel is one unfortunate result of the spirited competition between computer manufacturers. Their efforts to maintain individuality of product have been responsible for the several dozen business language systems that confront and confuse today's computer users. While some of these systems are strikingly similar, none are compatible, and they offer little hope for a common language that can be used to program business problems without regard to the make or model of computer involved.

The lack of such a common language is the concern of many; not the least of whom is the Department of Defense. Charles A. Phillips, director of the department's Data Systems Research Staff, gave some compelling reasons for this concern. According to his figures the department has some 225 general purpose computer systems in action with about 175 more on order. In addition, the civilian agencies of the government have installed about 60 systems with approximately 30 more on order.

The cost of programming these business systems exceeded $15 million in 1959 and will be about $29 million in the current fiscal year. In addition, Mr. Phillips pointed out, a detailed performance evaluation of a number of older Defense Department installations revealed that programming was almost always far behind its anticipated schedule and that the time requirements and cost of programming had invariably been grossly underestimated.

It is apparent from these facts and figures why the Department of Defense has a vital interest in developing a common language, which would simplify programming and provide compatability among competitive systems.

Under Mr. Phillips direction an informal organization of computer users and manufacturers has developed such a language, (See COBOL, page 22). It is still to be tried and tested, and many refinements will probably be necessary. Nevertheless, it is a powerful beginning toward the ultimate goal of an effective common language for business computers. All those who have labored in its behalf deserve high praise for their volunteer efforts—and encouragement for continuation of the project.

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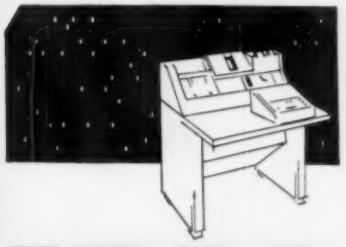

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